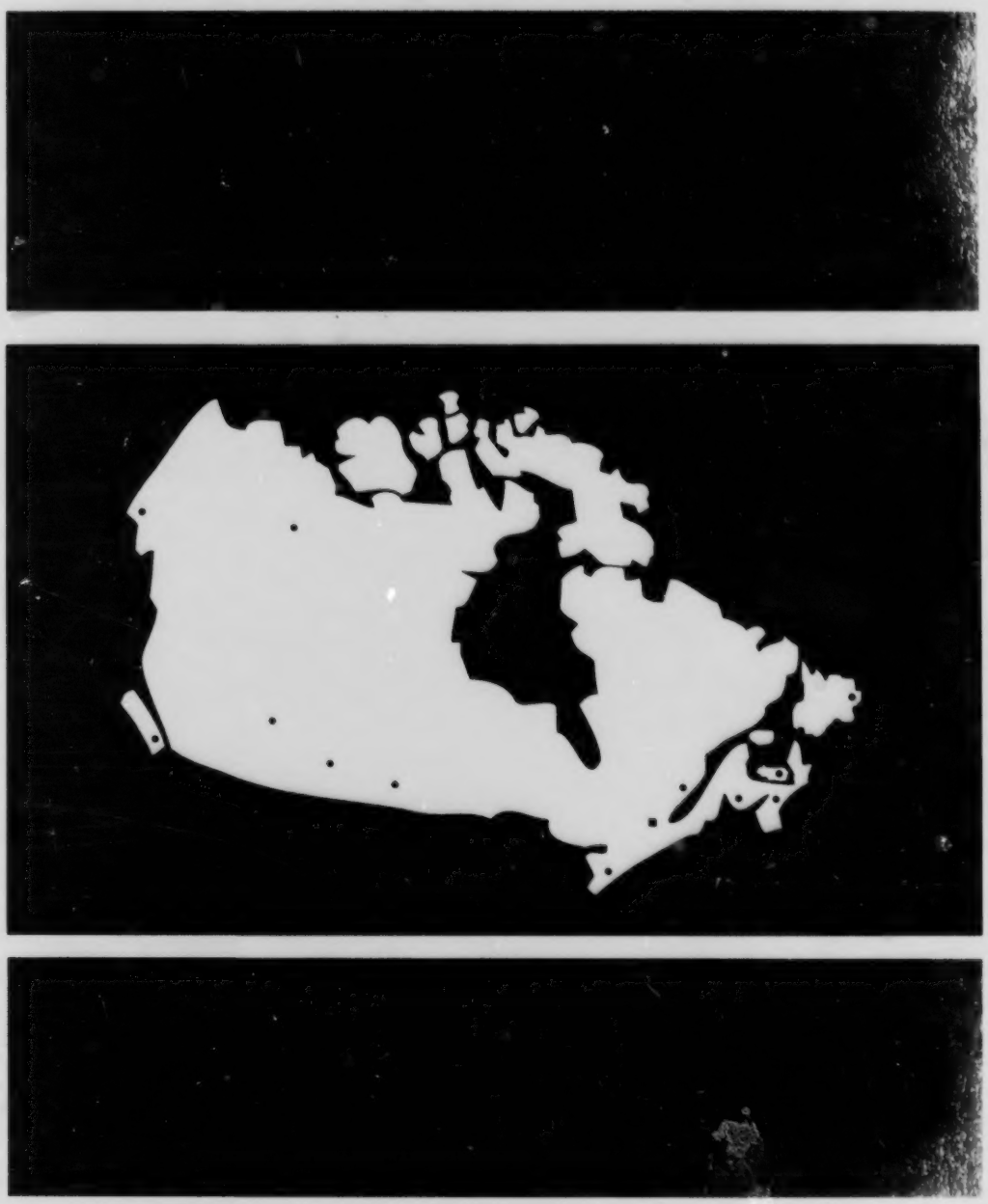
OCCUPATIONAL ANALYSES SERIES



Human Resources Development Canada
Développement des ressources humaines Canada

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Occupational Analyses Series

Recreation Vehicle Mechanic

2000

Interprovincial Partnerships and
Occupational Information Division

Human Resources
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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this occupational analysis as the national standard for the occupation of recreation vehicle mechanic.

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This analysis was prepared by the Human Resources Partnerships Directorate of HRDC in partnership with the Saskatchewan Apprenticeable Trades Coordinating Group (ATCoG). The overall planning and coordination of the development of this analysis were undertaken by staff members of HRDC's Interprovincial Partnerships and Occupational Information Division.

OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by a recreation vehicle mechanic whose occupational title has been identified by some provinces and territories of Canada under the following names:

- Recreation Vehicle Technician
- Recreation Vehicle Service Technician

LIST OF PUBLISHED OCCUPATIONAL ANALYSES *

TITLE	NOC** Code
Appliance Service Technician (1997)	7332
Aquaculture Technician (1977)	2221
Arts Administrator (1989)	0114
Automotive Painter (1995)	7322
Automotive Service Technician (1998)	7321
Automotive Technician - Automatic Transmission (1990)	7321
Automotive Technician - Electrical/Electronics (1992)	7321
Automotive Technician - Engine Repair and Fuel Systems (1989)	7321
Automotive Technician - Front-End (1989)	7321
Automotive Technician - Manual Transmission, Driveline and Brakes (1990)	7321
Aviation Machinist (1994)	7231
Baker (1997)	6252
Blaster (Surface) (1987)	7372
Boilermaker (1994)	7262
Bricklayer (2000)	7281
Cabinetmaker (2000)	7272
Carpenter (1998)	7271
Cement Finisher (1995)	7282
Construction Electrician (1994)	7241
Cook (1997)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician - Consumer Products (1997)	2242
Electronics Technician Vol. I (1986) (Video Equipment)	2242
Electronics Technician Vol. II (1986) (Audio Equipment)	2242

* **Red Seal analyses are indicated in bold**

** **National Occupational Classification**

Electronics Technician Vol. III (1986) (Computer Equipment)	2242
Electronics Technician Vol. IV (1986) (Office Equipment)	2242
Electronics Technician Vol. VI (1986) (Communication Equipment)	2242
Electronics Technician Vol. VII (1986) (Signaling Equipment)	2242
Electronics Technician Vol. VIII (1986) (Navigation Equipment)	2242
Electronics Technician Vol. IX (1986) (Video Game Equipment)	2242
Electronics Technician Vol. X (1987) (CADD Equipment)	2242
Electronics Technician Vol. XI (1987) (CAM Equipment)	2242
Electronics Technician Vol. XII (1987) (Robotics Equipment)	2242
Electronics Technician Vol. XIII (1987) (Biomedical and Laboratory Equipment)	2242
Electronics Technician Vol. XIV (1987) (Industrial Process-Control Equipment)	2243
Farm Equipment Mechanic (2000)	7312
Floorcovering Installer (1997)	7295
Glazier (1994)	7292
Hairstylist (1997)	6271
Heating (Gas and Oil) Servicer - Commercial and Industrial (1978)	7331
Heavy Duty Equipment Mechanic (1998)	7312
Heavy Equipment Operator (1983)	7421
Industrial Electrician (1997)	7242
Industrial Instrument Mechanic (2000)	2243
Industrial Mechanic (Millwright) (1999)	7311
Insulator (Heat and Frost) (2000)	7293
Ironworker (Generalist) (1993)	7264
Lather (Interior Systems Mechanic) (1994)	7284

Logistics (1992)	0713
Machinist (1998)	7231
Major Electrical Appliance Repairer (1984)	7332
Mobile Crane Operator (1997)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (Metal and Paint) (1997)	7322
New Home Builder and Residential Renovation Contractor (1992)	0712
Oil Burner Mechanic (1997)	7331
Painter and Decorator (2000)	7294
Partsperson (1995)	1472
Plumber (1996)	7251
Power Engineer (1997)	7351
Powerline Technician (1996)	7244
Recreation Vehicle Mechanic (2000)	7383
Refrigeration and Air Conditioning Mechanic (1997)	7313
Roofer (1997)	7291
Sheet Metal Worker (1997)	7261
Sprinkler System Installer (1995)	7252
Steamfitter-Pipefitter (1996)	7252
Steel Fabricator (Fitter) (1994)	7263
Tool and Die Maker (1997)	7232
Truck-Trailer Repairer (1994)	7321
Truck and Transport Mechanic (2000)	7321
Welder (1996)	7265

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Interprovincial Partnership and Occupational Information Division
Human Resources Partnerships
Human Resources Development Canada
Place du Portage, Phase IV, 5th Floor
Hull, Quebec K1A 0J9

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources Development Canada sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of interprovincial standards "Red Seal" examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of trainees and skilled workers;
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a knowledgeable consultant who, with the assistance of a committee of industry experts in the field, identifies all the tasks performed in the occupation.

The draft is then assigned to occupational analysts at Human Resources Development Canada for translation and then returned to the consultant for review to ensure conformity with the nationally approved format.

The consultant will then forward a copy of this analysis to provincial/territorial authorities for validation by specialists in the field. Their recommendations are assessed and incorporated into the final draft which also includes the identification of the common core tasks performed in the occupation.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate the understanding of the nature of the occupation, the work performed is divided into the following divisions:

A. **BLOCK** - is the largest division within the analysis and reflects a distinct operation relevant to the occupation.

B. **TASK** - is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".

C. **SUB-TASK** - is the smallest division into which it is practical to subdivide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Supporting Knowledge & Abilities

The element of skill and knowledge that an individual must acquire to adequately perform the task is identified under this heading.

Trends

Any shifts or changes in technology which affects the block are identified under this heading.

Related Components

All components of a specified task being undertaken by the recreation vehicle mechanic are identified under this heading.

Tools and Equipment

All tools and equipment necessary for the recreation vehicle mechanic to complete a task are identified under this heading.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization SubCommittee developed a method for the validation of the national Red Seal occupational analyses.

A draft of the analysis is sent to all provinces/territories for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the national occupational analyses identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Red Seal examinations.

DEFINITIONS

YES:	the sub-task is performed by workers in the occupation in a specific jurisdiction.
NO:	the sub-task is not performed by workers in the occupation in a specific jurisdiction.
BLOCK %:	the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, which will be placed on an interprovincial examination to assess each block of the analysis.
TASK %:	the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, which will be placed on an interprovincial examination to assess each task of the analysis.
NV:	Not Validated by a province/territory.
ND:	Not Designated in a province/territory.

PROVINCIAL/TERRITORIAL ABREVIATIONS

NF:	Newfoundland and Labrador
NS:	Nova Scotia
PE:	Prince Edward Island
NB:	New Brunswick
QC:	Quebec
ON:	Ontario
MB:	Manitoba
SK:	Saskatchewan
AB:	Alberta
BC:	British Columbia
NT:	Northwest Territories
YK:	Yukon

COMMON CORE

The criteria for determining common core are dependant on the performance of sub-tasks. If 70 percent of the responding jurisdictions (excluding NVs and NDs) perform the sub-task, it shall be considered common core.

Interprovincial Red Seal examinations are based on the common core identified through this validation process. This process identifies what will be assessed through the interprovincial examination.

BLOCKS AND TASKS WEIGHTING (APPENDIX "B")

This appendix represents the block and task percentages as submitted by each jurisdiction.

Each jurisdiction, with the use of a provincial/territorial occupational advisory committee, validates the content, places percentages on blocks and tasks, and indicates whether or not the sub-tasks are performed by the skilled workers within the occupation. The results of this exercise are submitted to the consultant who then analyzes the data and develops this appendix which provides the individual jurisdictional validation results as well as the national averages of all responses.

PIE CHART (APPENDIX "C")

The graph depicts the national percentages assigned to blocks in the analysis.

SCOPE OF THE RECREATION VEHICLE MECHANIC

This occupational analysis identifies tasks that a qualified RV mechanic is called upon to perform in Canada. An RV mechanic is a tradesperson who possesses a full range of knowledge, abilities and skills required to troubleshoot, disassemble, repair, assemble, install, adjust, test, maintain and modify components and systems, on Class A, B, and C motorhomes, holiday trailers, fifth wheel trailers, park model trailers, truck campers and tent trailers. RV mechanics are also required to work on utility, flat deck trailers, construction living trailers and an assortment of mobile vehicles.

RV mechanics must be versatile. The vehicles they work on can be very expensive. The RV mechanic can be under pressure to repair the vehicle in a quick and expedient manner. The recreation vehicle mechanic's skill at using varied hand and power tools and test instruments allows him or her to install and repair appliances, siding, roofs, windows, doors, vents, awnings, floor coverings, plumbing systems, electrical systems, propane gas systems, batteries and charging systems, trailer braking systems, TV antennas, light plants and hitches as well as doing fibreglass/body repairs.

RV mechanics must be conscious of the impact on people, equipment, work area and the environment when working. Safety is important due to the the wide range of systems which include; hydraulic systems, brake systems, propane detetion systems and electrical systems.

RV mechanics must call on their knowledge of mechanical systems, electric systems, plumbing systems, RV construction processes, LPG distribution systems and material characteristics. Though not described in this analysis as knowledge, skills or attitudes, some important attributes of the RV mechanic include: mechanical and mathematical aptitude, an ability to plan and think sequentially, an ability to work as a team member and possess good spatial concepts. As an essential part of the recreation vehicle service trade, the mechanics endeavor to align themselves with new technological advances and ever changing techniques and procedures in their industry.

The functions of RV mechanics may overlap with other trades such as parts person, automotive service technician, electrician, plumber, gas fitter, carpenter, welder and auto body repair person.

OCCUPATIONAL OBSERVATIONS

Some important observations and significant trends emerged from this National Analysis of the Recreational Vehicle Mechanic occupation. These observations and trends are briefly outlined in this section.

The recreation vehicle mechanic is a "jack-of-all-trades", repairing and maintaining all internal and external systems associated with a recreation vehicle except engine and drive train components. The individual requires skills related to plumbing, electrical, gas fitting, carpentry, floor covering, glacier and auto body repair. The diversity of equipment they work on goes from the largest A Class self-propelled motor home to the smallest tent trailer and everything in between. Employers are looking for individuals with the skills related to the construction sector and mode of power industry.

The recreation vehicle mechanic is employed by a variety of types of companies including dealerships, manufacturers and service and rental shops.

SAFETY

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties become aware of circumstances which may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to cause an accident or injury.

It is generally recognized that a safety-conscious attitude and work practices contribute to a healthy, safe and accident-free working environment.

It is imperative to apply and be familiar with the Occupational Health and Safety Act and Regulations. As well, it's essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

As safety education is an integral part of a training in all jurisdictions, personal safety practices are not recorded in this document. However, the technical safety aspect relating to each task and sub-task are included throughout this analysis.

ANALYSIS

BLOCK A

FUNDAMENTAL OCCUPATIONAL SKILLS

Trends: *Towards a greater importance placed on customer satisfaction.*

Task 1 **Demonstrates safe work practices.**

Related Safety Documentation/Supplies: WHMIS regulations, occupational health and safety regulations, CAW/CSA, gloves, face shields, safety glasses, goggles, ear muffs, fire extinguishers, first aid station, eye wash station.

Tools and Equipment: None.

Sub-task

1.01 **Complies with government and occupational health and safety regulations and procedures.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

1.01.01 knowledge of potential safety hazards such as fumes, chemicals, electrical and fire hazards

1.01.02 knowledge of work practice hazards such as power tools, hand tools, torches, hoists

1.01.03 knowledge of applicable safety act and regulation, Workplace Hazardous Material Information System (WHMIS) as Provincial WCB and related Occupation Health and Safety Act

1.01.04 knowledge of federal chlorofluorohydrocarbons regulations (CFC)

1.01.05 knowledge of fuel safety branch regulations

1.01.06 knowledge of code requirements

1.01.07 knowledge of requirement to report accidents and incidents

Supporting Knowledge & Abilities

1.01.08	knowledge of employees and employer responsibilities under provincial and federal regulations
1.01.09	knowledge of due diligence
1.01.10	ability to recognize hazards and safety violations

Sub-task

1.02 Utilizes personal protective equipment.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

1.02.01	knowledge of types of personal protective equipment
1.02.02	knowledge of dangers associated with jewelry, loose clothing and long hair when working with machinery
1.02.03	knowledge of maintenance and adjusting procedures for protective equipment
1.02.04	knowledge of location of safety equipment
1.02.05	knowledge of operating procedures for safety equipment
1.02.06	ability to maintain and adjust protective equipment
1.02.07	ability to operate safety equipment

Sub-task

1.03 Maintains work area.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

1.03.01	knowledge of waste disposal procedures
1.03.02	knowledge of procedures for maintaining cleanliness in the work area
1.03.03	knowledge of procedures for cleaning up spills
1.03.04	knowledge of procedures for removing debris and hazards
1.03.05	knowledge of procedures for storing and handling products, such as acetylene, oxygen, propane, butane, chemicals, sealants, solvents, adhesives and refrigerants
1.03.06	knowledge of lockout procedures
1.03.07	ability to store tools and equipment
1.03.08	ability to recognize safety hazards associated with propane gas, acetylene, oxygen, butane and electrical panels, wiring and appliances

Task 2 **Utilizes drawings, codes, standards and service manuals.**

Related Components: Drawings, electrical codes, propane codes, CSA codes for RV's.

Tools and Equipment: Measuring tape, calculators.

Sub-task

2.01 **Interprets blueprints, drawings and schematics.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

2.01.01	knowledge of information contained in blueprints and drawings
2.01.02	knowledge of mechanical, hydraulic, electronic and electrical symbols that indicate location of devices, routing of wire, vents, plumbing and specific system notes

Supporting Knowledge & Abilities

2.01.03	knowledge of acquisition and storage procedures
2.01.04	ability to overlay blueprints to produce "3D" picture
2.01.05	ability to convert schematics to ladder diagrams
2.01.06	ability to locate symbols, dimensions, materials and specifications
2.01.07	ability to perform metric conversions

Sub-task

2.02 Interprets codes, trade standards and government regulations.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

2.02.01	knowledge of codes, trade standards and government regulations such as propane codes, electrical codes, plumbing codes, occupational health and safety acts, CSA and other applicable codes
2.02.02	knowledge of types of vehicles, parts, components and assemblies
2.02.03	ability to identify type and model of vehicle, component, part

Sub-task

2.03 Interprets service literature.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

2.03.01	knowledge of service literature including shop manuals, maintenance manuals, bulletins and parts catalogues

Supporting Knowledge & Abilities

2.03.02	knowledge of repair sequences, repair diagrams and flow charts
2.03.03	knowledge of location of service information in manuals, technical bulletins, service supplements and parts catalogues
2.03.04	ability to identify repair procedures and to select test equipment, tools and replacement parts
2.03.05	ability to read wiring schematics, assembly drawings
2.03.06	ability to interpret repair sequence, repair diagrams and flow charts
2.03.07	ability to research specifications for repairs

Task 3 **Utilizes tools and measuring equipment.**

Related Components: Hammers, saws, files, screwdrivers, socket sets, wrenches, pliers, drivers, grinders, drill presses, sanders, staplers, wire cutters, wire crimpers, tap and die set, tube cutter, pry bar, inspection lights, clamps, impact wrenches, hole saw, reciprocating saw, tube benders, tape measures, vernier calipers, straight edge, multimeters, pressure gauges, drill bits, drivers, gas leak detectors, manometers, thermometers, air flow meters, squares, levels, utility knives, circuit board testers, nibblers and shears, rivet guns, caulking guns, chisels, awl, protractors, dividers, scribes.

Tools and Equipment: Grinders, lubricants, cleaning solvents, cleaning rags, filters, batteries.

Sub-task

3.01 **Uses hand tools.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

3.01.01	knowledge of purpose, types, styles and operation of hand tools
3.01.02	knowledge of manufacturers instructions for the safe use and maintenance of hand tools
3.01.03	knowledge of standard imperial and metric tool sizes
3.01.04	ability to select hand tools
3.01.05	ability to use measuring and layout tools
3.01.06	ability to use cutting tools
3.01.07	ability to use fastening hand tools
3.01.08	ability to use dismantling tools
3.01.09	ability to sharpen hand tools
3.01.10	ability to clean and lubricate hand tools
3.01.11	ability to store hand tools

Sub-task

3.02 Operates portable power tools.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

3.02.01	knowledge of purpose, types, style and operation of power tools
3.02.02	knowledge of manufacturers instructions for use and maintenance of power tools
3.02.03	ability to select portable power tools
3.02.04	ability to use portable power saws
3.02.05	ability to use portable power drills

Supporting Knowledge & Abilities

3.02.06	ability to use portable routing and planing tools
3.02.07	ability to use impact tools
3.02.08	ability to use sealants and glue guns
3.02.09	ability to use abrading and polishing tools
3.02.10	ability to use fastening tools
3.02.11	ability to use nibblers and shears
3.02.12	ability to use jacks
3.02.13	ability to clean and lubricate portable power tools
3.02.14	ability to store portable power tools
3.02.15	ability to maintain portable power tools such as changing power cords, repairing pneumatic hoses, replacing filters and batteries

Sub-task

3.03 Operates stationary power tools and lifting equipment.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

3.03.01	knowledge of purpose, types, and operation of stationary power tools and lifting equipment
3.03.02	knowledge of manufacturers instructions for the safe use and maintenance of stationary power tools and lifting equipment
3.03.03	ability to select stationary power tools
3.03.04	ability to use stationary saws such as band, table, radial arm, chop
3.03.05	ability to use stationary drilling and boring tools

Supporting Knowledge & Abilities

3.03.06	ability to use metal brakes and shears
3.03.07	ability to use hoists
3.03.08	ability to clean and lubricate stationary power tools
3.03.09	ability to sharpen tooling such as saw blades and tool bits
3.03.10	ability to store tooling
3.03.11	ability to maintain stationary power tools

Sub-task

3.04 Operates measuring equipment.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

3.04.01	knowledge of purpose, design and operating techniques for precision measuring devices
3.04.02	knowledge of manufacturers instructions for operating and maintaining measuring devices
3.04.03	knowledge of accuracy of measuring devices and approximation of error
3.04.04	ability to select precision measuring device
3.04.05	ability to distinguish between metric and imperial measuring devices
3.04.06	ability to use dimensional measuring devices such as tapes, micrometers and verniers
3.04.07	ability to use alignment and leveling measuring devices such as straight edge and squares
3.04.08	ability to use layout measuring tools such as dividers, protractors, squares, scribes, centre punches, awls

Supporting Knowledge & Abilities

3.04.09	ability to calibrate measuring equipment
3.04.10	ability to clean and lubricate measuring equipment
3.04.11	ability to store measuring equipment

Sub-task

3.05 Operates test equipment. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

3.05.01	knowledge of types, construction and uses of testing devices such as pressure gauges, carbon monoxide detector, thermometers, multimeters, air flow meters, manometers, ignition tester refrigerator diagnostic tools, liquid propane leak detector
3.05.02	knowledge of accuracy of testing devices
3.05.03	ability to measure temperatures
3.05.04	ability to measure electrical values
3.05.05	ability to measure pressure
3.05.06	ability to measure volume of air moving through ducting
3.05.07	ability to check testing devices for accuracy and calibration
3.05.08	ability to adjust measuring devices
3.05.09	ability to store measuring devices

Task 4 **Demonstrates common work practices and procedures.**

Related Components: Tubing, hoses, piping, compression fittings, elbows, T joints, Y joints, solvents, glues, ABS, PVC and PEX tubing, wiring, terminations, soldering, fasteners, sealants, adhesives, gaskets and gasket material, gas cutting equipment, arc welding equipment, solvent baths, component cleaning procedures, plastic welding techniques, vehicle preventative maintenance sketch preparation.

Tools and Equipment: Flaring tools, hand tools, pipe reamer, pipe wrenches, soldering gun, crimpers, wire strippers, power tools, power washers, solvent baths, caustic baths, brake cleaners, heat gun, plastic rod.

Sub-task

4.01 **Installs tubing, piping, hoses and fittings.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

4.01.01 knowledge of properties of fluids and the effects of temperature and pressure

4.01.02 knowledge of types, applications and properties of tubing

4.01.03 knowledge of types, applications and properties of piping

4.01.04 knowledge of types, applications and properties of hoses

4.01.05 knowledge of types, applications and properties of fittings

4.01.06 ability to select tubing, piping, hoses and fittings

4.01.07 ability to repair hoses, piping, tubing and fittings

4.01.08 ability to connect hoses, piping, tubing and fittings

4.01.09 ability to splice piping, tubing and hoses

Supporting Knowledge & Abilities

4.01.10 ability to cut piping, hoses and tubing

4.01.11 ability to bend and flare tubing

Sub-task

4.02 Installs wiring and connectors.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

4.02.01 knowledge of types of wiring harnesses and connectors

4.02.02 knowledge of construction, composition and operation of wiring circuits

4.02.03 knowledge of symptoms of wiring malfunctions, such as interrupted circuits, loose connections, burnt or broken wiring, corroded connections

4.02.04 ability to conduct static and dynamic testing of wiring and circuits

4.02.05 ability to route and secure wiring

4.02.06 ability to terminate wiring

4.02.07 ability to splice wiring

4.02.08 ability to insulate wire connections

Sub-task

4.03 Applies fasteners, sealants, adhesives and gaskets.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

4.03.01 knowledge of types, styles, construction, application and selection criteria for fastening devices

Supporting Knowledge & Abilities

4.03.02	knowledge of galvanic corrosion
4.03.03	knowledge of methods and applications for locking fastening devices
4.03.04	knowledge of types and properties of sealants
4.03.05	knowledge of conditions under which sealants are subjected to pressure, compatibility, conformity
4.03.06	knowledge of adhesive types and properties
4.03.07	knowledge of compatibility of adhesives with material to be bonded
4.03.08	knowledge of styles, construction and application of gaskets and gasket materials
4.03.09	knowledge of conditions to which gaskets are subjected
4.03.10	knowledge of manufacturers recommendations regarding replacement servicing and maintenance of gaskets
4.03.11	ability to remove broken bolts and studs
4.03.12	ability to clean, lubricate and maintain threads on fasteners
4.03.13	ability to select fasteners, sealants, adhesives and gaskets
4.03.14	ability to install fastener locking and sealing chemicals
4.03.15	ability to apply sealants
4.03.16	ability to mix and apply adhesives
4.03.17	ability to install gaskets and gasket materials

Sub-task

4.04 Performs trade related welding operations.

Supporting Knowledge & Abilities

(NOT COMMON CORE)

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	no	no	yes	yes	yes	ND	yes	no	ND	yes

4.04.01	knowledge of provincial licensing requirements for welding
4.04.02	knowledge of ventilation and local and general dilution requirements
4.04.03	knowledge of design function and application of components of gas welding equipment
4.04.04	knowledge of design, function and application of components of arc, oxyacetylene and mig welding equipment
4.04.05	knowledge of safety precautions and protective equipment required for welding operations
4.04.06	knowledge of cutting torch techniques
4.04.07	ability to set-up and store welding equipment
4.04.08	ability to set-up and store arc and mig welding equipment
4.04.09	ability to prepare surfaces for welding
4.04.10	ability to weld and braze materials
4.04.11	ability to run single and multiple beads
4.04.12	ability to maintain welding equipment
4.04.13	ability to fabricate metal products

Sub-task

4.05 Performs plastic welding operations.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	no	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

4.05.01	knowledge of the compatibility of different types of plastics
4.05.02	knowledge of plastic welding techniques
4.05.03	knowledge of types and operation of plastic welding
4.05.04	ability to clean plastic surfaces
4.05.05	ability to prepare joints and cracks for repair
4.05.06	ability to run plastic beads
4.05.07	ability to build up plastic pads
4.05.08	ability to test adhesion and strength of plastic welds

Sub-task

4.06 Cleans parts and components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

4.06.01	knowledge of operating procedures for cleaning equipment such as pressure washers, solvent washers, sand blasters, parts cleaning equipment
4.06.02	knowledge of protective equipment requirements
4.06.03	knowledge of hazards associated with brake cleaning
4.06.04	knowledge of maintenance procedures for cleaning equipment
4.06.05	ability to prepare components and assemblies for cleaning
4.06.06	ability to select cleaning agents

Sub-task

4.07 Prepares sketches.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

4.07.01	knowledge of mechanical, hydraulic and electrical symbols
4.07.02	knowledge of drawing scales
4.07.03	ability to measure dimensions
4.07.04	ability to sketch vapour propane gas system modifications
4.07.05	ability to sketch water system modifications
4.07.06	ability to sketch electrical system modifications
4.07.07	ability to sketch modifications to cabinetry

Sub-task

4.08 Performs recreational vehicle preventative maintenance.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

4.08.01	knowledge of required preventative maintenance procedures
4.08.02	knowledge of equipment required to perform preventative maintenance
4.08.03	ability to test LP gas systems
4.08.04	ability to service and adjust appliance
4.08.05	ability to test ground fault interrupt circuits
4.08.06	ability to winterize coach

Supporting Knowledge & Abilities

4.08.07	ability to check safety items
4.08.08	ability to check and lube doors
4.08.09	ability to check lights
4.08.10	ability to check window and roof moulding seals
4.08.11	ability to change oil and filters
4.08.12	ability to lubricate chassis
4.08.13	ability to inspect and top-up fluids
4.08.14	ability to service batteries
4.08.15	ability to check wiper blades
4.08.16	ability to inspect belts and hoses
4.08.17	ability to visually inspect chassis
4.08.18	ability to check lug nuts and tire pressures
4.08.19	ability to test drive vehicle
4.08.20	ability to check and set-up hitching system

Task 5 **Provides customer service.**

Related Components: Active listening skills, interpersonal skills, conflict resolution skills, communication skills, cross-cultural communication skills, documentation skills, negotiation skills.

Tools and Equipment: Work orders, customer files, customer satisfaction questionnaires.

Sub-task

5.01 **Develops customer relations.** **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

5.01.01	knowledge of effective communication techniques
5.01.02	knowledge of body language meaning
5.01.03	knowledge of techniques for resolving conflicts
5.01.04	knowledge of other cultures
5.01.05	ability to listen actively
5.01.06	ability to ask direct questions
5.01.07	ability to clarify responses
5.01.08	ability to empathize with customers
5.01.09	ability to develop alternate solutions to conflicts or disagreements
5.01.10	ability to negotiate resolution to conflicts or disagreements
5.01.11	ability to build trust and rapport
5.01.12	ability to respond to customer inquiries in person or on the phone
5.01.13	ability to provide suggestions and helpful hints to customers
5.01.14	ability to act courteously
5.01.15	ability to document customer concerns
5.01.16	ability to follow-up promptly with customer
5.01.17	ability to maintain clean work area
5.01.18	ability to demonstrate concern for customers property through the use of protective coverings
5.01.19	ability to return replaced parts

Sub-task

5.02 Maintains service records. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

5.02.01	knowledge of essential requirements of work orders
5.02.02	knowledge of warranty coverage
5.02.03	knowledge of company purchasing procedures
5.02.04	knowledge of parts requisitioning and return procedures
5.02.05	knowledge of standard rates, work hours expended and work in progress
5.02.06	knowledge of company time recording procedures
5.02.07	knowledge of repair report writing
5.02.08	ability to complete work orders
5.02.09	ability to complete purchase orders
5.02.10	ability to complete parts requisition forms
5.02.11	ability to document consumables used
5.02.12	ability to complete timesheets
5.02.13	ability to complete warranty documentation

BLOCK B

PLUMBING SYSTEMS

Trends: *Towards the use of PEX and CPUC tubing, external showers, city water to fill potable water fill. Polybutyl tubing is obsolete. With respect to wastewater, there is a trend towards electric gate valves, telescope sewer dump, macerator dump system, tank heaters, and non-toxic chemicals (non-formaldehyde).*

Task 6 **Maintains potable water systems.**

Related Components: Fresh water tank, tank drain, inlet tubing, fresh water fill piping, tubing and fittings, vents, clamps, vent hose, tie down, sediment filter, pump, accumulator, faucets, shower heads, city water regulator, toilets, sinks, tubs, line drains, hot water heater bypasses, shutoff-off valves, drinking water filter, Teflon tape, pipe tape, sealant, solder, flux, crimps, hardware, antifreeze, water fresheners, butt connector, cements, solvents, silicon, putty tape.

Tools and Equipment: Crimping tools, wrenches, channel locks, basin wrench, screwdrivers, pliers, propane torch, blow-out plug, pipe cutter, hack saw, flaring tool, vice grips, tape measure, faucet wrench, hammer, utility knife, spin weld drivers, electric drill, drill bits, hole bits, saws, router.

Sub-task

6.01 **Replaces storage tanks and components.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.01.01 knowledge of storage tank materials and sizes

6.01.02 knowledge of removal and installation procedures

6.01.03 knowledge of impact of movement/vibration on tank and mounting hardware

6.01.04 knowledge of types, materials and requirements for mounting hardware

Supporting Knowledge & Abilities

6.01.05	ability to locate and position tank
6.01.06	ability to install fittings, drains and vents
6.01.07	ability to secure tanks
6.01.08	ability to calculate capacity of storage tank

Sub-task

6.02 Repairs storage tanks and components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.02.01	knowledge of storage tank materials
6.02.02	knowledge of tank repair procedures such as plastic welding techniques and gluing methods
6.02.03	knowledge of water fresheners and sterilizers
6.02.04	ability to install fittings
6.02.05	ability to plastic weld patches and cracks
6.02.06	ability to spin weld plastic fittings
6.02.07	ability to clean, abrade, sand tank surfaces
6.02.08	ability to fill tanks
6.02.09	ability to test tank for leaks

Sub-task

6.03 Repairs distribution system.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

6.03.01	knowledge of tubing and piping materials
6.03.02	knowledge of tubing and piping sizes
6.03.03	knowledge of thread sizes and types
6.03.04	knowledge of types of fittings such as compression, 90° and Tee fittings
6.03.05	knowledge of DC electricity operation
6.03.06	knowledge of pump operation
6.03.07	knowledge of accumulators
6.03.08	ability to work in tight spaces
6.03.09	ability to replace/splice water lines
6.03.10	ability to locate water leaks
6.03.11	ability to test water system
6.03.12	ability to clean up water leaks
6.03.13	ability to repair water pump
6.03.14	ability to flare tubing
6.03.15	ability to bench test pump

Sub-task

6.04 Replaces distribution parts. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.04.01	knowledge of location of parts such as filters, check-valves, lines
6.04.02	knowledge of methods to remove pressure before starting repairs

Supporting Knowledge & Abilities

6.04.03	knowledge of procedures to remove and replace plumbing parts
6.04.04	ability to replace pump and pump parts
6.04.05	ability to replace filters
6.04.06	ability to replace accumulator tank
6.04.07	ability to replace valves

Sub-task

6.05 Repairs plumbing fixtures. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.05.01	knowledge of types and operation of toilets, faucets, showers, shower stalls
6.05.02	knowledge of types of valves, seals, and hoses
6.05.03	knowledge of methods for fibreglassing
6.05.04	ability to remove toilets, faucets, sinks, shower stalls and tubs
6.05.05	ability to replace closet seals
6.05.06	ability to replace ball valves, float assemblies, vacuum breaker, pedal mechanism, slide valves, seats and lids, gaskets, faucet stems, O-rings, cables, P-traps, PO plugs
6.05.07	ability to work with fibreglass

Sub-task

6.06 Replaces plumbing fixtures. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

6.06.01	knowledge of installation and removal procedures for fixtures
6.06.02	ability to remove fixtures
6.06.03	ability to bench test toilets
6.06.04	ability to install fixtures
6.06.05	ability to hook up potable water to fixtures

Sub-task

6.07 Winterizes potable systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.07.01	knowledge of types of potable anti-freeze liquids
6.07.02	knowledge of location of drain valves
6.07.03	knowledge of location of by-pass valves
6.07.04	knowledge of types of by-pass systems
6.07.05	ability to check valve operation
6.07.06	ability to pump anti-freeze into water system
6.07.07	ability to install water heater by-pass
6.07.08	ability to install pump conversion kit
6.07.09	ability to use blow-out plug
6.07.10	ability to flush system
6.07.11	ability to remove/replace drinking water filters
6.07.12	ability to winterize appliances such as clothes washer and dishwasher
6.07.13	ability to drain ice-makers

Sub-task

6.08 Tests potable water systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

6.08.01	knowledge of operation of pumps, valves, fixtures
6.08.02	knowledge of monitor panel operation
6.08.03	knowledge of hand pump operation
6.08.04	knowledge of flushing and sanitizing procedures
6.08.05	ability to physically operate fixture
6.08.06	ability to activate pump
6.08.07	ability to operate hand pumps
6.08.08	ability to dewinterize

Task 7 Maintains waste water systems.

Related Components: Black water tank, gray water tank, 1¼, 1½, 2, 3" ABS fittings, ABS pipes, ABS glue, gate valves, flow-way valve, sewer hoses, sewer hose adapters, traps, drains, termination caps, pop vent, drain cleaners, toilet chemicals, toilet paper, Vaseline, silicon spray, seals, closet flange, sealants, pipe dope, Teflon tape, tank mounts, plumbing straps, rubber couplers, hose clamps, hangers, screws, bolts, nuts, washers, back flush adapter.

Tools and Equipment: Snakes, glue equipment, saws, measuring tape, sandpaper, toilet wand, screw gun, wrenches, screwdrivers, pliers, channel lock pliers.

Sub-task

7.01 Repairs waste holding tanks and components. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

7.01.01	knowledge of tank materials
7.01.02	knowledge of tank repairs and procedures
7.01.03	knowledge of types of toilet chemicals and treatments
7.01.04	knowledge of venting requirements
7.01.05	knowledge of location of tanks
7.01.06	ability to replace tanks
7.01.07	ability to splice ABS pipes
7.01.08	ability to replace gate valves, toilets, tank fittings such as torpedo and closet
7.01.09	ability to weld and glue patches and cracks
7.01.10	ability to drain tank
7.01.11	ability to clean tank
7.01.12	ability to measure and size tanks
7.01.13	ability to calculate tank capacity

Sub-task

7.02 Repairs collection system. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

7.02.01	knowledge of collection system location
7.02.02	knowledge of rubber couplers
7.02.03	knowledge of collection system operation
7.02.04	ability to remove and replace collection system
7.02.05	ability to replace p-traps

Supporting Knowledge & Abilities

7.02.06	ability to replace drains
7.02.07	ability to replace shower tub pan
7.02.08	ability to replace gaskets
7.02.09	ability to replace sink basins

Sub-task

7.03 Tests waste water systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

7.03.01	knowledge of waste water system location
7.03.02	knowledge of flood test procedures
7.03.03	knowledge of when to turn water off
7.03.04	knowledge of flow test procedures
7.03.05	knowledge of potential leakage areas
7.03.06	ability to identify leaks
7.03.07	ability to identify obstruction locations
7.03.08	ability to identify venting problems

BLOCK C

ELECTRICAL

Trends: *Generator sets are getting larger and are more frequently found on board in response to larger load requirements. There is a trend to the increased use of inverters and the use of solar panels for battery recharge, and a larger number of batteries installed on RV's.*

Task 8 **Maintains AC electrical system.**

Related Components: Wires, connectors, tape (electrical), fasteners (wrap, tie, screws, bolts etc), loom, receptacles, switches, circuit breakers (fuses), motor oil, filters, gas (diesel), solder, terminal cleaners (chemical spray), power supply cord, plugs, panel boxes.

Tools and Equipment: Crimp tools, strippers, DMM (circuit tester), basic hand tools (pliers, screwdrivers, wrenches), electric drills, bits, hack saw, knife, drain bucket and funnel, filter wrench, soldering iron (gun), wire brush.

Sub-task

8.01 **Replaces AC power cords and connectors.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

8.01.01	knowledge of Ohm's law
8.01.02	knowledge of removal and installation procedures
8.01.03	ability to attach wires
8.01.04	ability to solder connections

Sub-task

8.02 **Repairs generator set.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	no	yes	yes	yes	ND	yes	yes	ND	no

8.02.01	knowledge of small engine operation
8.02.02	knowledge of generator operating principles
8.02.03	knowledge of strategy based diagnostics
8.02.04	ability to repair carburetor and ignition
8.02.05	ability to repair starting system switches and harness

Supporting Knowledge & Abilities

8.02.06	ability to replace generator components, and brushes
8.02.07	ability to assess DMM readings
8.02.08	ability to repair transfer switches

Sub-task

8.03 Services generator set.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

8.03.01	knowledge of engine maintenance procedures
8.03.02	knowledge of generator maintenance procedures
8.03.03	knowledge of correct service intervals
8.03.04	knowledge of small engine operation
8.03.05	knowledge of generator operating principles
8.03.06	knowledge of strategy based diagnostics
8.03.07	knowledge of lubricants S.A.E. (Society of Automotive Engineers) viscosity ratings and A.P.I. (American Petroleum Institute) service levels
8.03.08	ability to replace starting system switches and harness
8.03.09	ability to replace generator components and brushes
8.03.10	ability to assess DMM readings
8.03.11	ability to replace transfer switches
8.03.12	ability to replace filters
8.03.13	ability to drain lubricants and refill

Supporting Knowledge & Abilities

8.03.14	ability to replace spark plug(s) or ignition components
8.03.15	ability to adjust voltage output of generator set
8.03.16	ability to service exhaust components

Sub-task

8.04 Repairs AC distribution system.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

8.04.01	knowledge of components on a distribution system such as service panel, switches, breakers, wires, connectors, receptacles
8.04.02	ability to position and secure panels
8.04.03	ability to install 2-way, 3-way switches
8.04.04	ability to attach wire breakers and receptacles

Sub-task

8.05 Tests AC electrical systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

8.05.01	knowledge of Ohm's law
8.05.02	knowledge of testing procedures for AC electrical systems
8.05.03	ability to test voltage to distribution panel
8.05.04	ability to test voltage output of Generator set
8.05.05	ability to test cycles on the Generator set

Supporting Knowledge & Abilities

8.05.06 ability to test voltage/amperage output to load

8.05.07 ability to evaluate test findings

Task 9 Maintains DC electrical systems.

Related Components: Batteries, converters, isolators, battery box (house), conductors, circuit protection (fuses, fuse link, circuit breaker), distribution panel, loads (lights 12 volts, 12 volt fans), water pump, wire, connectors, fasteners (wrap tie, screws, bolts, etc), loom, receptacles, switches, circuit protectors, solder, shrink tube, tape, monitor panels.

Tools and Equipment: Hydrometer – distilled water, wire strippers, crimp tools, DMM (VAT40), battery booster, alternator tester, battery charger (fast, trickle), test light, basic hand tools, electric drill, drill bits, screwdriver bits, knife, battery terminal cleaners, soldering iron (gun), heat gun, cord test tool, jumper leads, battery carrying strap.

Sub-task

9.01 Services batteries.

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

9.01.01 knowledge of Ohm's law

9.01.02 knowledge of battery construction and types

9.01.03 knowledge of testing procedures, (hydrometer, load testing)

9.01.04 knowledge of safety precautions

9.01.05 knowledge of recharging procedures

9.01.06 knowledge of installation procedures

9.01.07 ability to operate test equipment

Supporting Knowledge & Abilities

9.01.08	ability to operate recharging equipment
9.01.09	ability to clean terminals
9.01.10	ability to adjust fluid level(s)
9.01.11	ability to remove and install batteries

Sub-task

9.02 Repairs converters.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

9.02.01	knowledge of converter types and construction (repairable, non-repairable)
9.02.02	knowledge of output capacities
9.02.03	knowledge of repair procedures
9.02.04	knowledge of testing units and components
9.02.05	knowledge of installation precautions
9.02.06	ability to operate testing equipment
9.02.07	ability to replace defective components
9.02.08	ability to retest after repair (output voltage, amperage, recharge, volt lamp)
9.02.09	ability to replace units

Sub-task

9.03 Repairs DC distribution systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

9.03.01	knowledge of Ohm's law
9.03.02	knowledge of service panels and components
9.03.03	knowledge of fuses, circuit breaker types, switches, conductors, relays, receptacles
9.03.04	knowledge of testing procedures for service panel
9.03.05	ability to operate testing equipment
9.03.06	ability to evaluate test results
9.03.07	ability to repair or replace components

Sub-task

9.04 Repairs monitoring systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

9.04.01	knowledge of monitor systems and sensors
9.04.02	knowledge of testing procedures
9.04.03	knowledge of available repair procedures
9.04.04	ability to operate testing equipment
9.04.05	ability to repair or replace components or system

Sub-task

9.05 Tests DC electrical systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

9.05.01	knowledge of Ohm's law (DC)
9.05.02	knowledge of testing procedures
9.05.03	knowledge of repair procedures and precautions
9.05.04	ability to evaluate test findings
9.05.05	ability to operate test equipment
9.05.06	ability to test voltage and amperage to load
9.05.07	ability to test supply voltage and amperage to distribution panel

Sub-task

9.06 Checks inverters and solar panels.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

9.06.01	knowledge of models and manufacturers' specifications
9.06.02	knowledge of testing procedures
9.06.03	knowledge of repair procedures and precautions
9.06.04	knowledge of how sun angle and dirty surfaces affect solar panel operation
9.06.05	knowledge of heat resistance levels of solar panels
9.06.06	ability to evaluate test finding
9.06.07	ability to size a system to a customer's needs

BLOCK D

LP GAS

Trends: *Towards new types of fill valves on bottle containers and use of quick connectors.*

Task 10 **Maintains high pressure LP gas system.**

Related Components: Containers (ASME, bottle), hoses, fasteners, brackets, valves, paint, thread sealer, O-rings, gauge, manometer, T-fitting.

Tools and Equipment: Wrenches, screwdrivers, drill bits, drills, leak detector, hacksaw, welder, tape measure, square, wire brush, scale, flashlight, date stamp equipment, hammer.

Sub-task

10.01 **Inspects high pressure LP system containers, piping and valves.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

10.01.01 knowledge of tank/container applications

10.01.02 knowledge of installation and removal procedures

10.01.03 knowledge of date codes

10.01.04 knowledge of characteristics of LP gas

10.01.05 ability to operate detector equipment

10.01.06 ability to evaluate condition, age of container

10.01.07 ability to determine whether valve is functional

Sub-task

10.02 Replaces high pressure LP gas system components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

10.02.01	knowledge of system components such as tanks, valves and hoses
10.02.02	knowledge of installation and removal procedures
10.02.03	knowledge of valve types
10.02.04	ability to install valves
10.02.05	ability to install hoses
10.02.06	ability to secure tanks
10.02.07	ability to position tanks
10.02.08	ability to remove tanks

Sub-task

10.03 Services high pressure LP gas systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	no	yes	yes	yes	ND	yes	yes	ND	yes

10.03.01	knowledge of paint types
10.03.02	knowledge of fill procedures for both container types
10.03.03	knowledge of purging procedures
10.03.04	ability to apply paint
10.03.05	ability to fill to required level
10.03.06	ability to determine tank types

Sub-task

10.04 Recertifies high pressure LP containers.

Supporting Knowledge & Abilities

(NOT COMMON CORE)

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	no	no	no	yes	yes	yes	ND	yes	yes	ND	yes

10.04.01 knowledge of types of valves

10.04.02 ability to install valves

10.04.03 ability to inspect LP container for damage, corrosion

10.04.04 ability to date stamp container

Task 11 Maintains low pressure LP gas systems.

Related Components: Regulator, tubing (rubber, aluminum, steel, copper), fittings, fasteners, pipe thread compounds, methyl hydrate.

Tools and Equipment: Flaring tools, drill and bits, saw, tube cutter, wrenches, pipe bender, holesaw, leak detector (liquid and electronic), manometer, screwdriver.

Sub-task

11.01 Replaces low pressure LP system components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

11.01.01 knowledge of pipe sizing

11.01.02 knowledge of pipe material

11.01.03 knowledge of routing

11.01.04 knowledge of regulator types and installation methods

Supporting Knowledge & Abilities

11.01.05	knowledge of testing procedures
11.01.06	ability to flare tubing
11.01.07	ability to fasten/secure the distribution system
11.01.08	ability to thread steel pipe
11.01.09	ability to design system
11.01.10	ability to conduct leak test
11.01.11	ability to adjust and regulate pressure

Sub-task

11.02 Services low pressure LP systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

11.02.01	knowledge of method to detect leaks
11.02.02	knowledge of regulators
11.02.03	knowledge of types of piping systems
11.02.04	knowledge of types of contaminants
11.02.05	ability to perform leak tests
11.02.06	ability to perform pressure tests
11.02.07	ability to remove contaminants
11.02.08	ability to replace protective coverings
11.02.09	ability to adjust and regulate pressure

BLOCK E

APPLIANCES

Trends: *Towards the use of heat pumps, the use of direct spark ignition style ranges/ovens, indoor-outdoor stoves, and use of refrigerator fans.*

Task 12 **Maintains furnaces and associated systems.**

Related Components: Heat exchanger, electrodes, motor, fan, thermostat, vents, ducts, relay, pilot assembly, thermocouple, orifice, burner, limit switch/high temperature switch, sail switch, gaskets, DSI board, piezo lighter, combustion air hose, gas valve, capillary tubes, gas control, electric gas control, circuit breaker, electrical connectors, wire, tubing, fasteners, thread sealant, putty tape, gas connectors, thermopile, duct tape, clamps, fan switch, electrical connectors, high voltage cable.

Tools and Equipment: Wrenches, screwdriver, manometer, multimeter, utility knife, pliers, leak detector, air flow meter, drill bits, hole saw, saw, wire cutter, crimping tool, wire stripper, flaring tools, tube bender, stapler, air compressor, brushes, thermometer, wet-dry vacuum, circuit board tester, tape measure, square.

Sub-task

12.01 Diagnoses furnace faults. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

12.01.01 knowledge of sequence of operations

12.01.02 knowledge of system requirements

12.01.03 knowledge of DC systems

12.01.04 knowledge of LP gas systems

12.01.05 knowledge of power testing equipment

12.01.06 knowledge of types of furnaces such as gravity-fed, forced air (direct spark ignition and pilot)

12.01.07 knowledge of AC systems

Supporting Knowledge & Abilities

12.01.08	ability to locate components off schematics
12.01.09	ability to check power and gas supply
12.01.10	ability to detect damaged/defective parts
12.01.11	ability to diagnose flame characteristics
12.01.12	ability to recognize signs of poor installation
12.01.13	ability to recognize signs of blocked venting and ducting
12.01.14	ability to isolate faulty component(s)
12.01.15	ability to calibrate LP gas system

Sub-task

12.02 Replaces furnace components and ducting.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

12.02.01	knowledge of system requirements and components
12.02.02	knowledge of DC systems
12.02.03	knowledge of liquid propane gas systems
12.02.04	knowledge of power testing equipment
12.02.05	knowledge of installation and removal procedures for components
12.02.06	ability to locate components in furnace
12.02.07	ability to shut off gas and power supplies
12.02.08	ability to conduct gas leak tests
12.02.09	ability to calibrate thermostat and anticipator

Supporting Knowledge & Abilities

12.02.10 ability to install electrical connection

12.02.11 ability to splice/install ducting

Sub-task

12.03 Replaces furnaces.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

12.03.01 knowledge of system requirements such as venting, piping, ducting

12.03.02 knowledge of AC, DC circuits and LP gas systems

12.03.03 knowledge of installation and removal procedures

12.03.04 knowledge of thermostat location

12.03.05 ability to shut off gas and power

12.03.06 ability to modify openings

12.03.07 ability to determine location for furnace

12.03.08 ability to conduct leak tests

12.03.09 ability to add/modify ducting and venting

12.03.10 ability to modify/install AC/DC circuit

12.03.11 ability to modify/install gas supply

12.03.12 ability to calibrate LP gas system

Sub-task

12.04 Services furnaces, components, ducting and return air.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

12.04.01	knowledge of system requirements
12.04.02	knowledge of sequence of operations
12.04.03	knowledge of AC and DC circuits and LP gas systems
12.04.04	knowledge of component operation
12.04.05	knowledge of removal and installation procedures
12.04.06	knowledge of routing and improving duct systems
12.04.07	ability to identify service requirements
12.04.08	ability to shut off gas and AC/DC
12.04.09	ability to calibrate LP gas system and thermostat
12.04.10	ability to clean orifice
12.04.11	ability to clean blower wheel
12.04.12	ability to perform leak test
12.04.13	ability to clean ducting
12.04.14	ability to test electrical components

Task 13 **Maintains water heaters.**

Related Components: Thermocouple, electrode, burner, element, pilot assembly, switches, pressure relief valves, anodes, orifice, drain plug, DSI board, bypass valves, high temperature thermal switch, gas thermostat, manual gas control valve, tank, electric valve, electric thermostat, insulation jacket, exterior assembly (housing/door), putty tape, pipe dope, Teflon tape, electrical connectors, high voltage cable.

Tools and Equipment: Wrenches, screwdriver, manometer, multimeter, utility knife, pliers, leak detector, drill bits, hole saw, saw, wire cutter, crimping tool, wire stripper, flaring tools, tube bender, stapler, air compressor, brushes, thermometer, wet/dry vacuum cleaner, circuit board tester, tape measure, square.

Sub-task

13.01 Diagnoses water heater faults.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

13.01.01	knowledge of sequence of operations
13.01.02	knowledge of system requirements
13.01.03	knowledge of AC and DC systems
13.01.04	knowledge of LP gas systems
13.01.05	knowledge of power testing equipment
13.01.06	knowledge of types of water heaters such as direct spark ignition, pilot, electric, and motor aid
13.01.07	ability to locate components off schematics
13.01.08	ability to check power and gas supply
13.01.09	ability to detect damaged/defective parts
13.01.10	ability to recognize signs of poor combustion
13.01.11	ability to recognize signs of poor installation

Supporting Knowledge & Abilities

13.01.12 ability to calibrate LP gas system

13.01.13 ability to isolate faulty component(s)

Sub-task

13.02 Replaces water heater components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

13.02.01 knowledge of system requirements and components

13.02.02 knowledge of AC and DC systems

13.02.03 knowledge of LP gas systems

13.02.04 knowledge of power testing equipment

13.02.05 knowledge of installation and removal procedures

13.02.06 ability to identify components

13.02.07 ability to locate components in water heater

13.02.08 ability to shut off gas and power supplies

13.02.09 ability to conduct gas leak tests

13.02.10 ability to correctly install electrical connections

13.02.11 ability to calibrate LP gas system

13.02.12 ability to adjust air adjustment

Sub-task

13.03 Replaces water heater.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

13.03.01	knowledge of system requirements such as piping, size
13.03.02	knowledge of AC, DC, motor aid and LP gas systems
13.03.03	knowledge of power testing equipment
13.03.04	knowledge of installation and removal procedures
13.03.05	ability to shut off gas and power
13.03.06	ability to modify openings
13.03.07	ability to determine location
13.03.08	ability to conduct leak tests
13.03.09	ability to modify/install AC/DC circuit
13.03.10	ability to modify/install gas supply
13.03.11	ability to perform leak test for gas and water

Sub-task

13.04 Services water heater and components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

13.04.01	knowledge of system requirements
13.04.02	knowledge of sequence of operations
13.04.03	knowledge of AC, DC, motor aid and LP gas systems

Supporting Knowledge & Abilities

13.04.04	knowledge of component operation
13.04.05	knowledge of removal and installation procedures
13.04.06	ability to identify service requirements
13.04.07	ability to shut off AC, DC gas system
13.04.08	ability to calibrate LP gas system
13.04.09	ability to adjust combustion air
13.04.10	ability to clean combustion components
13.04.11	ability to clean orifice
13.04.12	ability to clean electrical connections
13.04.13	ability to perform leak tests for gas and water
13.04.14	ability to de-scale tank and replace anode rod
13.04.15	ability to drain tank
13.04.16	ability to test thermocouple

Task 14 Maintains ranges and ovens.

Related Components: Gas controls, regulator, burners, grates/racks, pilot assembly, piezo lighter, electrodes, vents, fasteners, oven doors, hinges, springs, seals, thermocouples, thermostat, orifices, clocks, lights, wire, manifold, piping, thread sealant, gaskets, quick connectors, rubber hoses, high voltage cable.

Tools and Equipment: Wrenches, screwdriver, manometer, multimeter, utility knife, pliers, leak detector, drill bits, hole saw, saw, wire cutter, crimping tool, wire stripper, flaring tools, tube bender, stapler, air compressor, brushes, oven temperature tester, wet/dry vacuum, circuit board tester, tape measure, square.

Sub-task

14.01 Diagnoses ranges/ovens faults.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

14.01.01	knowledge of sequence of operations
14.01.02	knowledge of system requirements
14.01.03	knowledge of AC and DC systems and LP gas systems
14.01.04	knowledge of power testing equipment
14.01.05	knowledge of types of ranges and ovens such as non-pilot, piezo, portable
14.01.06	ability to check power and gas supply
14.01.07	ability to detect damaged/defective parts
14.01.08	ability to recognize signs of poor combustion
14.01.09	ability to recognize signs of poor installation
14.01.10	ability to recognize blocked venting
14.01.11	ability to isolate faulty component(s)
14.01.12	ability to calibrate LP gas system

Sub-task

14.02 Replaces ranges/ovens and components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

14.02.01	knowledge of system requirements
14.02.02	knowledge of AC, DC and LP gas systems

Supporting Knowledge & Abilities

14.02.03	knowledge of power testing equipment
14.02.04	knowledge of installation and removal procedures
14.02.05	ability to locate oven safety valve
14.02.06	ability to shut off gas and power supplies
14.02.07	ability to conduct gas leak test
14.02.08	ability to calibrate oven thermostat
14.02.09	ability to install electrical connections
14.02.10	ability to calibrate LP gas system
14.02.11	ability to adjust combustion air
14.02.12	ability to install/modify AC, DC, gas system
14.02.13	ability to add/modify opening
14.02.14	ability to replace gaskets and seals

Sub-task

14.03 Services ranges/ovens and components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

14.03.01	knowledge of system requirements
14.03.02	knowledge of sequence of operations
14.03.03	knowledge of AC, DC and LP gas systems
14.03.04	knowledge of component operation
14.03.05	knowledge of removal and installation procedures
14.03.06	ability to identify service requirements
14.03.07	ability to shut off gas, AC and DC

Supporting Knowledge & Abilities

14.03.08	*ability to calibrate LP system/thermostat*
14.03.09	ability to clean combustion components
14.03.10	ability to clean orifice
14.03.11	ability to perform leak test
14.03.12	ability to calibrate oven thermostat
14.03.13	ability to adjust combustion air
14.03.14	ability to adjust oven door

Task 15 Maintains refrigeration systems.

Related Components: Heat exchanger, electrodes, compressor, relay, thermostat (electric, gas), AC heating element, DC heating element, cooling unit, heat box, burner, orifice, thermocouple, tubing, piezo lighter, DSI board, power control, gas thermostat, electric switch, gas valve, eyebrow board, high voltage cable, wire, electronic connector, fuse, light switch, light, doors, gaskets, handles, hinges, baffles, shelving, thermistor, mullion heater, gas filter, bypass screw, flue cap, ducting, venting, wire harness, solenoid valve, drain tube, catch basin, thread sealer, thermomastic, foam tape, sealant, fasteners, foil tape, roof vent and cap, side vent, travel latch, masking tape.

Tools and Equipment: Wrenches, screwdriver, manometer, multimeter, utility knife, pliers, leak detector, drill bits, hole saw, saw, wire cutter, crimping tool, wire stripper, flaring tools, tube bender, stapler, air compressor, brushes, thermometer, pry bar, caulking gun, wet/dry vacuum, flue cleaner, circuit board tester, tape measure, square.

Sub-task

15.01 Diagnoses refrigeration faults.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

15.01.01	knowledge of sequence of operations
15.01.02	knowledge of system requirements
15.01.03	knowledge of AC, DC and liquid propane gas systems
15.01.04	knowledge of power testing equipment
15.01.05	knowledge of types of refrigerators such as compressor and absorption
15.01.06	knowledge of types of absorption refrigerators such as (AES) automatic energy selector, DSI, piezo
15.01.07	ability to locate components off schematics
15.01.08	ability to check power and gas supply
15.01.09	ability to detect damaged/defective parts
15.01.10	ability to recognize signs of poor combustion
15.01.11	ability to recognize signs of poor installation
15.01.12	ability to recognize signs of inadequate venting
15.01.13	ability to isolate faulty component(s)
15.01.14	ability to calibrate LP gas system
15.01.15	ability to bypass controls
15.01.16	ability to check circuit board
15.01.17	ability to test thermostat

Sub-task

15.02 Replaces refrigerator components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

15.02.01	knowledge of system requirements
15.02.02	knowledge of AC, DC and LP gas systems
15.02.03	knowledge of power testing equipment
15.02.04	knowledge of installation and removal procedures
15.02.05	ability to locate components in refrigerator
15.02.06	ability to shut off gas and power supplies
15.02.07	ability to conduct gas leak tests
15.02.08	ability to install electrical connections
15.02.09	ability to calibrate LP gas system
15.02.10	ability to modify venting
15.02.11	ability to test components prior to installation

Sub-task

15.03 Replaces refrigerators.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

15.03.01	knowledge of system requirements for venting, piping and sizing
15.03.02	knowledge of AC, DC and liquid propane gas systems
15.03.03	knowledge of installation and removal procedures
15.03.04	ability to shut off gas and power
15.03.05	ability to modify openings
15.03.06	ability to conduct leak tests
15.03.07	ability to add/modify ducting and venting
15.03.08	ability to modify/install AC/DC circuit

Supporting Knowledge & Abilities

15.03.09 ability to modify/install gas supply

15.03.10 ability to calibrate LP gas system

Sub-task

15.04 Services refrigerators, components and venting.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

15.04.01 knowledge of system requirements

15.04.02 knowledge of sequence of operations

15.04.03 knowledge of AC, DC and LP gas systems

15.04.04 knowledge of component operation

15.04.05 knowledge of removal and installation procedures

15.04.06 knowledge of routing and improving vent systems

15.04.07 ability to identify service requirements

15.04.08 ability to shut off gas and AC/DC

15.04.09 ability to calibrate LP gas system and thermostat

15.04.10 ability to clean orifice

15.04.11 ability to clean combustion components

15.04.12 ability to clean exterior coils

15.04.13 ability to clean vents

15.04.14 ability to clean flue and baffle

15.04.15 ability to perform leak test

Task 16 **Maintains air conditioning and heat pump systems.**

Related Components: Selector switch, thermostat, control board, main board, relay board, start relay, start capacitor, run capacitor, motor, overload protector, compressor, heat strip assembly, cold control, changeover thermostat, ambient sensor, relay DTSP, reversing valve, relay fan, wire harness, connectors, shrouds, ceiling assembly, equalizing valve, gaskets, seals, ducting, filter.

Tools and Equipment: Wrenches, screwdriver, multimeter, utility knife, pliers, air flow meter, drill bits, hole saw, saw, wire cutter, crimping tool, wire skimmer, stapler, air compressor, brushes, thermometer, wet/dry vacuum, circuit board tester, tape measure, square, ladder.

Sub-task

16.01 Diagnoses air conditioning and heat pump faults.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

16.01.01 knowledge of sequence of operations

16.01.02 knowledge of system requirements

16.01.03 knowledge of AC and DC systems

16.01.04 knowledge of power testing equipment

16.01.05 knowledge of types of air conditioning systems such as basement, wall, roof

16.01.06 knowledge of electronic climate control systems

16.01.07 ability to locate components off schematics

16.01.08 ability to check power supply

16.01.09 ability to detect damaged/defective parts

16.01.10 ability to recognize signs of poor installation

16.01.11 ability to recognize signs of blocked venting and ducting

16.01.12 ability to isolate faulty component(s)

Sub-task

16.02 Replaces air conditioning and heat pump electro-mechanical components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

16.02.01	knowledge of system requirements and components
16.02.02	knowledge of AC and DC systems
16.02.03	knowledge of power testing equipment
16.02.04	knowledge of installation and removal procedures for components
16.02.05	ability to locate components in air conditioning system and heat pumps
16.02.06	ability to install electrical connections
16.02.07	ability to shut off power supply
16.02.08	ability to discharge capacitors

Sub-task

16.03 Replaces air conditioning and heat pump systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

16.03.01	knowledge of system requirements and components such as venting, wiring, sizing
16.03.02	knowledge of AC and DC systems
16.03.03	knowledge of power testing equipment
16.03.04	knowledge of installation and removal procedures for components
16.03.05	ability to shut off power supply

Supporting Knowledge & Abilities

16.03.06	ability to modify openings
16.03.07	ability to add/modify ducting and venting
16.03.08	ability to modify/install AC/DC circuit

Sub-task

16.04 Services air conditioner and heat pump systems and ducting.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

16.04.01	knowledge of system requirements
16.04.02	knowledge of sequence of operations
16.04.03	knowledge of AC and DC systems
16.04.04	knowledge of component operation
16.04.05	knowledge of removal and installation procedures
16.04.06	knowledge of ways to improve duct systems
16.04.07	knowledge of service requirements
16.04.08	ability to shut off AC and DC supply
16.04.09	ability to discharge capacitor
16.04.10	ability to clean exchanger and components
16.04.11	ability to clean filters
16.04.12	ability to comb condenser fins
16.04.13	ability to clean fan blades
16.04.14	ability to replace gaskets

BLOCK F

INTERIOR COMPONENTS AND EXTERIOR SHELL

Trends: *General trend is towards increased cabinetry, built-in furniture and electronics. More detail, quality of finish is enhanced. Lighter finishes and upholstery. Greater utility space for storage. Greater use of slide outs. Extension speaker systems and external showers. Portable ranges. Greater use of rapid side wall construction using Styrofoam and fibreglass panels. Screened in add-a-rooms. Radius windows. Rounded roofs.*

Task 17 **Maintains interior components.**

Related Components: Paneling, moldings, sofa, furniture and related cabinets, such as TV stands, night stands, flooring, (carpet, hardwood, linoleum, ceramic tile) cabinets, plywood, laminate, hardware (hinges, catches, screws, nails, staples), interior software (fabric goods, valance, blinds), grout, adhesives, contact cement, floor adhesive, stain, closet hardware, magazine/spice racks, stovetop covers, sink covers, smooth edge, wood fillers, putty sticks, gas lift props, inspection checklist.

Tools and Equipment: Staple gun, screwdrivers, drills, bits, drivers, hammer, saws (jig saw, holesaw, sawsall, table saw, mitre saw), pliers, common hand tools, flooring adhesive spreader (trowel), caulking gun, socket set, square, level, sander, grinder, sand paper, paint brushes, cleaning material (rags, etc.), tape measure, pop riveter, wire strippers, wood clamps, router and bits, wire cutters, crimpers, carpet stretcher, tile cutter, screening tool, utility knife, tin snips.

Sub-task

17.01 **Inspects interior components.**

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

17.01.01 knowledge of RV construction

17.01.02 knowledge of interior component materials

17.01.03 knowledge of potential defects to material

Supporting Knowledge & Abilities

17.01.04 knowledge of inspection procedures and sequence

17.01.05 ability to identify defects in sidewalls, and ceilings, such as scratches, dents, holes, cuts, missing hardware, stains, bindings and buckling, missing panels

17.01.06 ability to identify defects in flooring and floor coverings, such as scratches, cuts, buckling in flooring, gouges, tears in carpeting, fading, stains, soft spots in flooring, improper seaming of flooring moldings, stretch of carpets

17.01.07 ability to identify defects in soft goods, such as tears, defective material, stains, fitting problems, deformation in foam upholstery fit, damaged springs, defective gas shocks, improper sizes for components

17.01.08 ability to identify defects in cabinetry such as missing/defective hardware, door slides and glides not installed properly, shelving improperly installed, scratches, dents, gouges, broken glass, molding shrinkage, improper cut outs, improper securing of cabinets to wall

17.01.09 ability to complete inspection checklist

Sub-task

17.02 Replaces sidewalls and ceiling surfaces.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

17.02.01 knowledge of procedures for removing and installing panels

17.02.02 knowledge of procedures for replacing molding and trim such as windows, cabinetry, wall plugs, covers, lamp fixtures, roof vent, garnishes, A/C ceiling assembly

Supporting Knowledge & Abilities

17.02.03	knowledge of removing and installing baths, tables, shower stalls
17.02.04	knowledge of removing and installing table and dinettes, hutches, chesterfields
17.02.05	knowledge of procedures for removing and installing appliances such as water heaters, refrigerators
17.02.06	knowledge of materials of sidewalls and ceiling surfaces
17.02.07	knowledge of insulation materials
17.02.08	knowledge of routing of electrical circuits
17.02.09	knowledge of manufacturing differences in construction
17.02.10	ability to measure, layout and cut ceiling and sidewall panel
17.02.11	ability to replace trim and molding
17.02.12	ability to fill and finish minor scratches
17.02.13	ability to stain/paint wooden surfaces
17.02.14	ability to replace ceiling fabrics

Sub-task

17.03 Replaces flooring and floor coverings.

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

17.03.01	knowledge of floor covering and adhesive
17.03.02	knowledge of flooring and sub flooring construction

Supporting Knowledge & Abilities

17.03.03	knowledge of procedures to remove/install floor coverings and carpets
17.03.04	knowledge of procedures for removing built-ins, and cabinetry
17.03.05	ability to remove rubber moldings where floor meets cabinetry or sidewalls
17.03.06	ability to prepare the sub floor
17.03.07	ability to cut out flooring, sub flooring
17.03.08	ability to install flooring/sub flooring patches
17.03.09	ability to apply adhesives
17.03.10	ability to patch floor coverings
17.03.11	ability to replace carpets and floor coverings such as hardwood, linoleum, asphalt tile, ceramic tile
17.03.12	ability to install carpets and floor coverings
17.03.13	ability to install moldings and trim

Sub-task

17.04 Replaces soft goods.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

17.04.01	knowledge of procedures to remove/install soft goods from walls and floor
17.04.02	knowledge of soft goods materials, upholstery, fabric, foams, leather, vinyl, screening, canvas
17.04.03	ability to repair rips and tears
17.04.04	ability to replace hardware, such as zippers, snaps, buttons

Supporting Knowledge & Abilities

17.04.05	ability to patch soft goods material
17.04.06	ability to replace blinds, curtains, drapes, valances
17.04.07	ability to replace foam
17.04.08	ability to replace fabrics
17.04.09	ability to re-secure soft good materials, leather, fabric, vinyl

Sub-task

17.05 Repairs cabinetry.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

17.05.01	knowledge of cabinetry defects
17.05.02	knowledge of cabinetry construction
17.05.03	knowledge of cabinet materials and adhesives
17.05.04	knowledge of removal and installation procedures for cabinetry
17.05.05	ability to replace spacers
17.05.06	ability to recover vinyl surfaces
17.05.07	ability to refinish wood surfaces
17.05.08	ability to replace laminates
17.05.09	ability to replace hardware
17.05.10	ability to replace panels in cabinets
17.05.11	ability to reassemble drawers
17.05.12	ability to replace cabinet/closet doors
17.05.13	ability to replace trim and molding

Sub-task

17.06 Replaces interior accessories. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

17.06.01	knowledge of installation and removal process of interior accessories
17.06.02	knowledge of types of fasteners and adhesives
17.06.03	ability to replace accessories such as towel racks, tooth brush holder, soap dish, mirrors, racks, shelves, medicine cabinets
17.06.04	ability to replace accessory components, dowels, shelves
17.06.05	ability to re-secure accessories to side wall surfaces

Task 18 Maintains exterior components.

Related Components: Aluminum skin (sidewalls) roofing, aluminum roofing, EPDM rubber sheeting, fibreglass sheeting and caps, windows, doors, storage hatches, vents (roof, fridge, stoves, furnace), door and hatch holders, fender skirts, rockguard, clearance/taillights, bottom board, under belly materials, and insulation (fibreglass, foam), moldings, vinyl inserts, putty, butyl tape, silicone, screw, staples, adhesives, sealants, plywood/paneling, various lumber.

Tools and Equipment: Common hand tools, air guns (nailer and staple gun) rubber mallet, saws, drills and bits, screwdrivers, hammer, saws (jig saw, skill saw, sawsall, holesaw, table saw, mitre saw, hack saw), pliers, flooring adhesive, spreader (trowel), caulking gun, socket set, square, level, sander, grinder, sandpaper, paint brushes, cleaning material (rags etc), tape measure, pop riveter, wire strippers, wood clamps, router and bits, wire cutters, crimpers, screening tool, utility knife, tin snips, glass cutters, hydraulic tester, cable crimper, volt/Ohm meter DMM (Digital multi-meter).

Sub-task

18.01 Inspects exterior components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.01.01	knowledge of RV construction techniques
18.01.02	knowledge of potential defects to material
18.01.03	knowledge of inspection procedures and sequence
18.01.04	knowledge of inspection checklist
18.01.05	ability to identify defects in sidewalls, roof and underbelly such as dents, scratches, holes, gouges, structural, tears, stains
18.01.06	ability to identify defects in exterior opening trims, seals, such as leaking windows, doors, molding, vents, roofs, improperly installed trims, seals
18.01.07	ability to identify defects in slide-out mechanism and lifting mechanism
18.01.08	ability to complete inspection checklist

Sub-task

18.02 Replaces roofing.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.02.01	knowledge of roof construction
18.02.02	knowledge of repair procedures
18.02.03	knowledge of material types (rubber, aluminum, fibreglass, galvanized, ABS)
18.02.04	ability to remove damaged roofing material

Supporting Knowledge & Abilities

18.02.05	ability to install new roofing material
18.02.06	ability to remove and re-install roof fixtures such as vents, roof AC, antennas, roof racks/ladder, to allow repairs to roof structure
18.02.07	ability to remove and install moldings, trims, awnings
18.02.08	ability to seal, patch roof
18.02.09	ability to remove and install rafters and wiring, ducting and insulation
18.02.10	ability to repair roof on fold downs

Sub-task

18.03 Replaces sidewalls.

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

18.03.01	knowledge of sidewall construction
18.03.02	knowledge of repair procedures
18.03.03	knowledge of material types such as fibreglass and aluminum
18.03.04	knowledge of dimensions and physical characteristics of unit and materials
18.03.05	ability to remove aluminum skin
18.03.06	ability to replace aluminum skin
18.03.07	ability to repair damaged fibreglass and FRP (fibre reinforced plastic) areas
18.03.08	ability to replace canvas (folddowns) or remove canvas for repairs
18.03.09	ability to remove items such as windows, doors, hatches, vents, outlets, awnings, slide-outs

Supporting Knowledge & Abilities

18.03.10	ability to replace windows, doors, hatches, vents, outlets, awnings, slide-outs
18.03.11	ability to replace sections of fibreglass and FRP walls
18.03.12	ability to seal all joints, openings
18.03.13	ability to remove moldings and trims
18.03.14	ability to replace moldings and trims
18.03.15	ability to repair structural damage
18.03.16	ability to install decals and striping

Sub-task

18.04 Repairs underbelly.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.04.01	knowledge of underbelly construction
18.04.02	knowledge of replacement procedures
18.04.03	knowledge of repair procedures
18.04.04	knowledge of types of material required for repairs/replacement
18.04.05	ability to assess repair/replacement, patches such as galvanized, plastic and bottom board
18.04.06	ability to remove waste tanks
18.04.07	ability to replace waste tanks
18.04.08	ability to remove propane tanks
18.04.09	ability to replace propane tanks
18.04.10	ability to remove plumbing
18.04.11	ability to replace plumbing

Sub-task

18.05 Repairs exterior openings. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.05.01	knowledge of installation of windows, doors, vents, compartment doors, hatches etc.
18.05.02	knowledge of the construction of above components
18.05.03	knowledge of repair/replacement procedures
18.05.04	ability to replace roof fixtures
18.05.05	ability to repair roof fixtures
18.05.06	ability to repair windows
18.05.07	ability to replace windows
18.05.08	ability to repair doors (entrance, storage)
18.05.09	ability to replace doors (entrance, storage)
18.05.10	ability to repair wheel wells
18.05.11	ability to replace wheel wells
18.05.12	ability to replace rockguards
18.05.13	ability to seal openings

Sub-task

18.06 Repairs roof lifting systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.06.01	knowledge of cable system
18.06.02	knowledge of gear system

Supporting Knowledge & Abilities

18.06.03	knowledge of repair procedures for different systems
18.06.04	knowledge of testing procedures
18.06.05	knowledge of flexible LP gas supply line
18.06.06	knowledge of flexible potable water supply line
18.06.07	knowledge of flexible waste water drain
18.06.08	ability to repair lift arms and pulleys on fold downs
18.06.09	ability to replace lift arms and pulley on fold downs
18.06.10	ability to replace and adjust cables
18.06.11	ability to replace roof lifting systems
18.06.12	ability to repair mechanical components
18.06.13	ability to replace mechanical components
18.06.14	ability to adjust all systems
18.06.15	ability to test all systems
18.06.16	ability to replace flexible LP gas supply lines
18.06.17	ability to repair flexible potable water supply line
18.06.18	ability to repair flexible waste water drain

Sub-task

18.07 Repairs slide-out systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

18.07.01	knowledge of electrical system
18.07.02	knowledge of hydraulic system

Supporting Knowledge & Abilities

18.07.03	knowledge of cable system
18.07.04	knowledge of gear system
18.07.05	knowledge of repair procedures for different systems
18.07.06	knowledge of testing procedures
18.07.07	knowledge of flexible LP gas supply line
18.07.08	knowledge of flexible potable water supply line
18.07.09	knowledge of flexible waste water drain
18.07.10	ability to replace and adjust cables
18.07.11	ability to replace and adjust hydraulic lines and cylinders
18.07.12	ability to replace slide-outs and slide-out actuating systems
18.07.13	ability to diagnose electrical components
18.07.14	ability to repair electrical components
18.07.15	ability to repair mechanical components
18.07.16	ability to replace mechanical components
18.07.17	ability to adjust all systems
18.07.18	ability to test all systems
18.07.19	ability to replace flexible LP gas supply lines
18.07.20	ability to repair flexible potable water supply line
18.07.21	ability to repair flexible waste water drain

BLOCK G

TOWING AND CHASSIS COMPONENTS

Trends: *Towards increased use of shock absorbers and tri-axles and the use of disc brakes on trailers as well as 5th wheel hitches and three-in-one balls.*

Task 19 **Maintains undercarriage components on towed vehicles.**

Related Components: Axles, saddles, spindles, inner and outer bearings and races, d-washer, castellated nuts, grease seals, axle grease, dust caps, cotter pins, u-bolts and nuts, springs, hangers, shackles, bushings, equalizer, spring bolts, spring centre bolts, torsion axles, shock absorbers, rubber bushings, wheels, tires, screw tongue jacks, hydraulic tongue jacks, electric tongue jack (mechanical, hydraulic and electric landing gear), electric motors, ball couplers, king pin and box, jack legs, gears, safety chains, pin locks, roller pins, tapered pins, frame, bumpers, paint, undercoating materials, lubricants, skid plate, hydraulic fluid, cleaning solvent, rags.

Tools and Equipment: Torque wrench, impact wrench and sockets, wrenches, hand tools, tape measure, jack stands, floor jack, air chisel, level, drill and bits, grinder and blades, cutting torch, tread depth gauge, tire valve stem tool, tire pressure gauge, air inflator, valve, valve installer tool, wire brush, wire connections, crimpers, wire strippers, bearing packer, air compressor, air nozzle, micrometer, bearing puller.

Sub-task

19.01 Services wheel and tires (towed).

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	no	ND	yes

19.01.01 knowledge of left and right threaded bolts for rim and tire compatibility

19.01.02 knowledge of tire tread wear patterns

19.01.03 knowledge of tire pressures

19.01.04 knowledge of tire types and load ranges

Supporting Knowledge & Abilities

19.01.05	knowledge of wheel nut torque
19.01.06	knowledge of signs of wheel damage
19.01.07	knowledge of grease seal sizes
19.01.08	knowledge of bearing diameters
19.01.09	knowledge of spindle diameter
19.01.10	knowledge of unbalanced tires
19.01.11	ability to interpret tire tread wear
19.01.12	ability to inflate tires
19.01.13	ability to change tires
19.01.14	ability to change tire valves
19.01.15	ability to jack and raise trailers

Sub-task

19.02 Repairs axles, hubs and bearings.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

19.02.01	knowledge of torque requirements
19.02.02	knowledge of axle capacities and attached components
19.02.03	knowledge of types of lubricants
19.02.04	knowledge of bearing wear and troubleshooting techniques
19.02.05	knowledge of axle arc and toe adjustment
19.02.06	knowledge of bearing types and sizes
19.02.07	knowledge of bolt patterns on hubs

Supporting Knowledge & Abilities

19.02.08	ability to replace axles
19.02.09	ability to replace bearings and adjust wheel bearings
19.02.10	ability to repack bearings
19.02.11	ability to replace grease seals
19.02.12	ability to replace bearing races

Sub-task

19.03 Replaces suspension systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

19.03.01	knowledge of bushing wear
19.03.02	knowledge of hanger wear
19.03.03	knowledge of spring capacities
19.03.04	knowledge of spring hanger height
19.03.05	knowledge of spring arc and length
19.03.06	knowledge of bushing types
19.03.07	knowledge of shock absorber types
19.03.08	knowledge of suspension types
19.03.09	knowledge of axle suspension types such as steel spring, torsion and rubber
19.03.10	ability to replace components such as springs, spring bolts, spring hangers spring shackles, and spring bushings
19.03.11	ability to replace equalizers
19.03.12	ability to replace shock absorber

Supporting Knowledge & Abilities

19.03.13 ability to replace rubbers

19.03.14 ability to inspect shock absorber

19.03.15 ability to test ride

Sub-task

19.04 Inspects frame.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

19.04.01 knowledge of rust and electrolysis

19.04.02 knowledge of undercoating materials

19.04.03 knowledge of paints, primers

19.04.04 knowledge of frame types such as 5th wheel and trailer

19.04.05 knowledge of "A" frames and reaches

19.04.06 knowledge of sizes of king pins and boxes

19.04.07 knowledge of types and sizes of hitch couplers

19.04.08 knowledge of bumper types and attachments

19.04.09 knowledge of painting and undercoating techniques

19.04.10 knowledge of frame material such as ferrous and aluminum

19.04.11 ability to replace bumpers

19.04.12 ability to sand, prep, prime, paint and undercoat

19.04.13 ability to spray on materials

19.04.14 ability to adjust hitch couplers

Sub-task

19.05 Repairs tongue jacks and landing gear.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

19.05.01	knowledge of gears
19.05.02	knowledge of jacks and landing gear capacities
19.05.03	knowledge of jack types such as mechanical, hydraulic and electric
19.05.04	knowledge of trailer hook up techniques
19.05.05	ability to replace rolled pins
19.05.06	ability to replace tapered pins
19.05.07	ability to replace tongue jacks
19.05.08	ability to replace 5th wheel landing legs
19.05.09	ability to replace motor
19.05.10	ability to replace gears
19.05.11	ability to replace electric switch

Task 20 Maintains braking systems.

Related Components: Backing plate assemblies, shoes, activating levers, adjustment springs, anchor springs, electromagnets, adjusters, lubricants, wire, wire connectors, brake cylinders, brake fluid, brake lines, brake line fittings and connectors, electrical tape, cable ties, shrink wrap, master cylinders, hydraulic actuators, brake controls, wire pin plugs, sealants, DC circuit breakers, fuses, variable resistors, break-a-ways and cable, 12 volt batteries, wheel drums, mounting hardware, brake cleaning fluid.

Tools and Equipment: Brake adjustment tools, brake spring pliers, anchor spring tool, wire strippers, wire crimpers, voltmeter, ammeter with induction pickup, DC test light, wrenches, hand tools, tape measure, easy outs, thread taps, drill and bits, vacuum cleaner.

Sub-task

20.01 Repairs electric braking components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

20.01.01	knowledge of troubleshooting procedures
20.01.02	knowledge of DC electricity
20.01.03	knowledge of brake lining materials
20.01.04	knowledge of wire sizing
20.01.05	knowledge of location of brake switch
20.01.06	knowledge of location of brake controller
20.01.07	knowledge of typical trailer brake wiring circuit
20.01.08	knowledge of location and function of brake-away switch
20.01.09	knowledge of wire colour codes
20.01.10	knowledge of location of primary and secondary shoes
20.01.11	knowledge of operation and function of brake assemblies (shoes, actuating levers)
20.01.12	knowledge of brake diameters
20.01.13	knowledge of brake shoe widths
20.01.14	ability to insulate connectors
20.01.15	ability to install and adjust brake controllers
20.01.16	ability to install and adjust brake shoes
20.01.17	ability to install DC circuit protectors
20.01.18	ability to replace brake-away switches
20.01.19	ability to jack and secure trailer

Supporting Knowledge & Abilities

20.01.20	ability to diagnose brake controller problems and scored brake drums
20.01.21	ability to clean brake shoes and brake drums
20.01.22	ability to isolate electrical problems between tow vehicle and trailers
20.01.23	ability to test electrical power
20.01.24	ability to test voltage and amp drop
20.01.25	ability to test braking system

Sub-task

20.02 Repairs hydraulic braking system.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

20.02.01	knowledge of troubleshooting procedures
20.02.02	knowledge of master cylinders
20.02.03	knowledge of wheel cylinders
20.02.04	knowledge of location and size of brake lines
20.02.05	knowledge of brake line materials
20.02.06	knowledge of brake fluid
20.02.07	knowledge of operation of actuator
20.02.08	knowledge of weight codes and limitations
20.02.09	knowledge of easy outs
20.02.10	knowledge of brake system tests
20.02.11	ability to replace master cylinder, wheel cylinder and wheel brake lines

Supporting Knowledge & Abilities

20.02.12	ability to double flare brake lines
20.02.13	ability to bleed brake lines
20.02.14	ability to fill master cylinder
20.02.15	ability to flush brake system
20.02.16	ability to adjust actuator
20.02.17	ability to check for leaks
20.02.18	ability to lubricate actuators
20.02.19	ability to remove broken bleeder screws

Task 21 **Maintains hitching system.**

Related Components: Class I, II, III, IV, and V receiver hitches, 5th wheel hitches (king pin style, goose neck), nuts and bolts, equalizers, anti-sway devices, swing hitch, balls, ball mounts, lubricants, hitch pins and clips, safety chains, clevis, shackles, quick links, s-hooks.

Tools and Equipment: Torque wrench, impact wrench, cutting torch, drill and bits, hammer, punch (centre), hand tools, angle grinder.

Sub-task

21.01 Replaces mechanical towing components.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

21.01.01	knowledge of troubleshooting procedures
21.01.02	knowledge of 5th wheel hitch types
21.01.03	knowledge of hitch classes and capabilities
21.01.04	knowledge of 5th wheel hitch

Supporting Knowledge & Abilities

21.01.05	knowledge of how to adjust pin box height
21.01.06	knowledge of ball mount heights
21.01.07	knowledge of tongue coupler sizes
21.01.08	knowledge of ball sizes
21.01.09	knowledge of weight distributing hitch height and angle
21.01.10	knowledge of trailer hook-up and un-hooking procedures
21.01.11	knowledge of lubricants and uses
21.01.12	knowledge of slick discs
21.01.13	ability to co-ordinate 5th wheel hitch height to king pin box height
21.01.14	ability to install and adjust weight distributing hitch
21.01.15	ability to replace hitches (Class I, II, III and IV)
21.01.16	ability to install and adjust anti-sway devices
21.01.17	ability to fish bolts along frame members
21.01.18	ability to road test anti-sway device
21.01.19	ability to hook up, unhook and maneuver towed vehicle

Sub-task

21.02 Installs towing components. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

21.02.01	knowledge of wiring harness for towing vehicles
21.02.02	knowledge of fibre optic wiring
21.02.03	ability to install hitches
21.02.04	ability to install transmission coolers
21.02.05	ability to match hitch to load being pulled

BLOCK H

ACCESSORIES

Trends: *Towards the installation of more electrical and mechanical accessories that support entertainment systems, leisure activities and R.V. safety.*

Task 22 **Performs accessories/system installations.**

Related Components: Automatic winterizing system, outside shower, telescopic dump systems, waste tank heater, tank flushing systems, macerators, fresh water filters, sewer hose adapters, pump conversion kit, drain hose storage tubes, pump noise dampers, sewer hose supports, water hose auto-rollup, water regulators, water heater, (110v. heating adapters), high pressure accumulators, ABS galvanized, pipe dope, Teflon tape, screws, bolt and hardware, plumbers strapping, plumbers grease, AC electrical wire, DC electrical wire, electric connections, snap fasteners, eyelets, rope, cord, assorted fasteners, twist lock, electrical tape, sealants, lubricants, coaxial ends, hydraulic fluid, varsol, paints, 9v batteries, smoke detectors, LPG detectors, CO detectors, radios, stereo, TV, VCR, CD players, coaxial splitter, CB radio, radio antenna, TV antenna, speakers, coaxial cable, satellite dish, spare tire racks, bicycle carriers, transmission coolers, electric and hydraulic leveling systems, stabilizer jacks (manual, electric and hydraulic transmission pumps), storage pods, awnings, add-a-rooms, microwaves, toaster ovens, clothes washers and dryers, dishwasher, ice makers, generators, inverters, vacuum cleaner, air horns, cell phones, dirt skirts, solar panels, mud flaps, rear vision camera, ceiling fans.

Tools and Equipment: Common hand tools, saws, drills and bits, pipe wrenches, hole coaxial crimper, PEX crimper, DC test light, VOM, impact wrench, ammeter with induction, measuring tape, pencil and paper, circular saws, reciprocating saws, LP leak detector, LP electronic leak detector, butane ignitor, square, plumb line, ladder.

Sub-task

22.01 **Installs/replaces plumbing accessories.** **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

22.01.01	knowledge of operation and location of plumbing accessories
22.01.02	knowledge of installation procedures to replace or install plumbing accessories
22.01.03	ability to prepare/modify site for plumbing accessories
22.01.04	ability to position and secure plumbing accessories
22.01.05	ability to hook-up piping and electrical
22.01.06	ability to restore interior/exterior to finished appearance

Sub-task

22.02 Installs/replaces entertainment and communication systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

22.02.01	knowledge of proposed location
22.02.02	knowledge of system operation and set-up requirements
22.02.03	knowledge of procedure to replace or install systems
22.02.04	ability to prepare/modify site for systems
22.02.05	ability to position and secure systems
22.02.06	ability to hook up electrical
22.02.07	ability to restore interior/exterior to finished appearance

Sub-task

22.03 Installs/replaces small electrical household appliances.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.03.01	knowledge of proposed location
22.03.02	knowledge of appliance(s) set-up and operation
22.03.03	knowledge of procedure to replace or install appliance
22.03.04	ability to prepare/modify site for appliance
22.03.05	ability to position and secure appliance
22.03.06	ability to hook up electrical
22.03.07	ability to restore interior/exterior surfaces to finished appearance

Sub-task

22.04 Installs/replaces safety and security systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

22.04.01	knowledge of proposed location
22.04.02	knowledge of types of security systems and types of detectors
22.04.03	knowledge of procedure to replace or install systems
22.04.04	ability to prepare/modify site for systems
22.04.05	ability to position and secure systems
22.04.06	ability to hook up electrical
22.04.07	ability to restore interior to finished appearance

Sub-task

22.05 Installs/replaces storage and access systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.05.01	knowledge of proposed location
22.05.02	knowledge of operation of systems
22.05.03	knowledge of procedure to replace or install systems
22.05.04	knowledge of types of sealant application
22.05.05	ability to prepare/modify site for systems
22.05.06	ability to position and secure systems
22.05.07	ability to hook up electrical for inverters and solar panels
22.05.08	ability to apply sealant
22.05.09	ability to restore exterior to finished appearance

Sub-task

22.06 Installs/replaces power supply systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.06.01	knowledge of proposed location
22.06.02	knowledge of operation of power supply systems such as solar, inverter and generator
22.06.03	knowledge of procedure to replace or install systems
22.06.04	ability to prepare/modify site for systems
22.06.05	ability to position and secure systems

Supporting Knowledge & Abilities

22.06.06 ability to hook up electrical and fuel for generator

22.06.07 ability to restore interior/exterior to finished appearance

Sub-task

22.07 Installs/replaces LP accessories.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.07.01 knowledge of proposed location

22.07.02 knowledge of operating requirements of LP

22.07.03 knowledge of procedure to replace or install systems

22.07.04 ability to prepare/modify site for systems

22.07.05 ability to position and secure systems

22.07.06 ability to hook up to LP gas system

22.07.07 ability to restore to finished appearance

Sub-task

22.08 Installs/replaces leveling, stabilizing and jacking systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.08.01 knowledge of proposed location

22.08.02 knowledge of leveling and stabilizing system(s) operation

Supporting Knowledge & Abilities

22.08.03	knowledge of procedure to replace or install systems
22.08.04	ability to prepare/modify site for systems
22.08.05	ability to position and secure systems
22.08.06	ability to hook up electrical
22.08.07	ability to hook up hydraulic systems
22.08.08	ability to fill and bleed hydraulic systems
22.08.09	ability to restore interior/exterior to finished appearance

Sub-task

22.09 Installs/replaces auxiliary chassis and towing components (suspension aids).

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.09.01	knowledge of proposed location
22.09.02	knowledge of operation of components
22.09.03	knowledge of procedure to replace or install components
22.09.04	knowledge of attaching procedure
22.09.05	ability to prepare/modify site for components
22.09.06	ability to position and secure components
22.09.07	ability to hook up components

Sub-task

22.10 Installs/replaces awning, skirting and add-a-rooms.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.10.01	knowledge of proposed location
22.10.02	knowledge of operation of awnings, skirting and add-a-room
22.10.03	knowledge of procedure to replace or install components
22.10.04	ability to prepare/modify site for systems
22.10.05	ability to position and secure systems
22.10.06	ability to install and seal fasteners
22.10.07	ability to restore exterior to finished appearance

Sub-task

22.11 Installs/replaces range hoods.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

22.11.01	knowledge of proposed location
22.11.02	knowledge of operation of range hoods
22.11.03	knowledge of procedure to replace or install range hoods and vents
22.11.04	knowledge of vent sizes
22.11.05	ability to prepare/modify site for systems
22.11.06	ability to position and secure systems
22.11.07	ability to hook up electrical and run wiring harnesses
22.11.08	ability to restore interior to finished appearance

Sub-task

22.12 Installs/replaces ice makers. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

22.12.01	knowledge of proposed location
22.12.02	knowledge of operation of ice makers
22.12.03	knowledge of procedure to replace or install ice makers
22.12.04	ability to prepare/modify site for ice makers
22.12.05	ability to position and secure systems
22.12.06	ability to hook up electrical supply and water supply
22.12.07	ability to isolate connection points in refrigerator
22.12.08	ability to differentiate fridge parts from ice maker parts
22.12.09	ability to restore exterior to finished appearance

Task 23 Maintains accessories/systems.

Related Components: Automatic winterizing system, outside shower, telescopic dump systems, waste tank heater, tank flushing systems, macerators, fresh water filters, sewer hose adapters, pump conversion kit, drain hose storage tubes, pump noise dampers, sewer hose supports, water hose auto-rollup, water regulators, water heater (110v. heating adapters), high pressure accumulators, ABS, galvanized pipe dope, lubricants, pipe tape, screws, bolts and hardware, plumbers strapping, plumbers grease, AC electrical wire, DC electrical wire, electric connections, snap fasteners, eyelets, rope, cord, assorted fasteners, twist lock, electrical tape, sealants, lubricants, coaxial ends, hydraulic fluid, varsol, paints, 9v batteries, smoke detectors, LPG detectors, CO detectors, radios, stereo, TV, VCR, CD players, coaxial splitter, CB radio, radio antenna, TV antenna, speakers, coaxial cable, satellite dish, spare tire racks, bicycle carriers, transmission coolers, electric and hydraulic leveling systems, stabilizer jacks (manual, electric and hydraulic) transmission pumps, storage pods, awnings, add-a-rooms.

Tools and Equipment: Common hand tools, saws, drills and bits, pipe wrenches, hole sawsall, hole punch, snap fastener tools, wire strippers and *crimpers, coaxial crimper, PEX crimper, DC test light, VOM,* impact wrench, ammeter with induction, measuring tape, pencil and paper, circular saws, reciprocating saws, LP leak solution, LP electronic leak detector, butane ignitor, square, plumb line, ladder.

Sub-task

23.01 Repairs plumbing accessories.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

23.01.01 knowledge of operation of plumbing accessories and systems

23.01.02 knowledge of removal and installation procedures

23.01.03 knowledge of repair procedures to determine if accessory is repairable

23.01.04 ability to replace macerator system components

23.01.05 ability to replace filters

Sub-task

23.02 Repairs entertainment and communication systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

23.02.01 knowledge of operation of components

23.02.02 knowledge of repair and troubleshooting procedures

23.02.03 knowledge of removal and installation procedures

23.02.04 ability to replace TV antenna parts

Supporting Knowledge & Abilities

23.02.05	ability to replace TV coaxial supply components
23.02.06	ability to replace 12 volt power supply components
23.02.07	ability to replace fuses/circuit protectors
23.02.08	ability to replace 12 volt receptacles
23.02.09	ability to verify AC/DC power supply
23.02.10	ability to replace speakers
23.02.11	ability to replace speaker wire and coaxial cable
23.02.12	ability to install electronic interference filters

Sub-task

23.03 Repairs small electrical household appliances.

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

Supporting Knowledge & Abilities

23.03.01	knowledge of operation and access points
23.03.02	knowledge of removal and installation procedures
23.03.03	knowledge of repair and troubleshooting procedures
23.03.04	ability to verify 12v/120v power supply
23.03.05	ability to replace fuses/breakers
23.03.06	ability to replace water lines/fittings
23.03.07	ability to clean vacuum hose and power head
23.03.08	ability to replace broken wiring

Sub-task

23.04 Services safety and security systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

23.04.01	knowledge of operation of safety equipment
23.04.02	knowledge of removal and installation
23.04.03	ability to verify power supply
23.04.04	ability to replace fuses, breakers, and batteries
23.04.05	ability to clean components
23.04.06	ability to test for proper operation
23.04.07	ability to change LP shut-off solenoid valve
23.04.08	ability to repair emergency escape hatches

Sub-task

23.05 Repairs storage and access systems. **Supporting Knowledge & Abilities**

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

23.05.01	knowledge of operation of access systems
23.05.02	knowledge of removal and installation procedures
23.05.03	knowledge of repair procedures
23.05.04	ability to diagnose electrical and mechanical defects
23.05.05	ability to repair rungs on step ladders
23.05.06	ability to remove ladder from coach

Supporting Knowledge & Abilities

23.05.07	ability to remove and install hinges and locking system on storage pods
23.05.08	ability to repair bike rack
23.05.09	ability to replace bike rack parts
23.05.10	ability to replace components on tire carrier

Sub-task

23.06 Repairs power supply systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

23.06.01	knowledge of troubleshooting procedures
23.06.02	knowledge of types, of solar, inverter (Generator set)
23.06.03	knowledge of AC/DC systems
23.06.04	knowledge of repair procedures
23.06.05	knowledge of electronic components such as diodes, switches, panels
23.06.06	ability to replace diodes
23.06.07	ability to replace switching systems
23.06.08	ability to replace wiring
23.06.09	ability to replace fasteners

Sub-task

23.07 Repairs LP accessories.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

Supporting Knowledge & Abilities

23.07.01	knowledge of types and operating requirements of electronic leak detectors, lamps, BBQs
23.07.02	knowledge of DC systems
23.07.03	knowledge of LP systems
23.07.04	knowledge of repair procedure
23.07.05	ability to replace auto shut-off valve
23.07.06	ability to replace detectors
23.07.07	ability to replace wiring systems
23.07.08	ability to replace lamp mantle
23.07.09	ability to replace lamp covers
23.07.10	ability to replace BBQ burners, quick connectors, hoses

Sub-task

23.08 Repairs leveling, stabilizing and jacking systems.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

23.08.01	knowledge of hydraulic systems
23.08.02	knowledge of mechanical systems
23.08.03	knowledge of electronic systems
23.08.04	knowledge of DC systems
23.08.05	knowledge of electric motor operation
23.08.06	knowledge of routing of wiring
23.08.07	knowledge of routing of tubing in hydraulic systems

Supporting Knowledge & Abilities

23.08.08	knowledge of amount of hydraulic fluid required by system
23.08.09	knowledge of types of hydraulic fluids
23.08.10	ability to bleed hydraulic systems
23.08.11	ability to replace seals
23.08.12	ability to lubricate mechanical systems
23.08.13	ability to replace gears
23.08.14	ability to replace commutator brushes
23.08.15	ability to replace circuit boards
23.08.16	ability to replace switches
23.08.17	ability to replace wire
23.08.18	ability to replace springs and mounts
23.08.19	ability to straighten inner sleeves on stabilizer jacks

Sub-task

23.09 Repairs awning, skirting and add-a-room.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

23.09.01	knowledge of materials
23.09.02	knowledge of securing techniques such as fasteners, snaps, turnbuckles and track and piping
23.09.03	knowledge of repair techniques
23.09.04	knowledge of removal and installation procedures

Supporting Knowledge & Abilities

23.09.05	ability to patch holes in fabrics
23.09.06	ability to replace fabrics
23.09.07	ability to replace framework pieces such as arms, rafters, tubes and tension springs
23.09.08	ability to replace fabric, plastic and metal panels

Sub-task

23.10 Repairs range hood.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	yes

23.10.01	knowledge of AC and DC systems
23.10.02	knowledge of range hood operations
23.10.03	knowledge of repair procedures
23.10.04	ability to replace fan blade
23.10.05	ability to replace fan motor
23.10.06	ability to replace filters, bulbs and switches
23.10.07	ability to remove vent opener
23.10.08	ability to adjust sleeve length on remote vent opener

Sub-task

23.11 Repairs ice makers.

Supporting Knowledge & Abilities

NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK
ND	yes	yes	yes	yes	yes	yes	ND	yes	yes	ND	no

23.11.01	knowledge of plumbing systems associated with ice makers

Supporting Knowledge & Abilities

23.11.02	knowledge of AC systems
23.11.03	knowledge of ice maker operation and system components
23.11.04	knowledge of repair procedures
23.11.05	ability to replace mould heater
23.11.06	ability to replace water valves
23.11.07	ability to replace electric motor and fan motor
23.11.08	ability to replace gears
23.11.09	ability to replace ice mould assembly
23.11.10	ability to replace ejector arms
23.11.11	ability to replace shutoff arms
23.11.12	ability to replace on/off switch
23.11.13	ability to replace wire harnesses and connectors

APPENDICES

TOOLS AND EQUIPMENT

Measuring and Test Equipment

air flow meter
ammeter (with induction pickup)
calculators
carbon-battery load tester
circuit board tester
DC test light
dial indicator
digital multimeter
flashlight
hydrometer
leak detectors (liquid and electronic)
level
manometer
measuring tape
micrometer
multimeter
oven temperature tester
plumb line
scale
square
test light
thermometer,
voltmeter
volt/ohmeter
weigh scale

Automotive Tools

air inflator
alternator tester
anchor spring tool
battery charger
battery starter
bearing packer
bearing puller
brake adjustment tools
brake spring pliers
filter wrench
floor jack
hoist
hydraulic tester
jack stands
tire pressure gauge
tread depth gauge
tree valve stem tool
valve installer tool

Hand Tools

Basic:
battery carrying strap
brushes
caulking gun
centre punch
date stamp equipment
easy outs
hack saw
hammers
hand drills
hand saw
heat gun
hole punch
jumper leads
nut driver
plastic rod
pliers
pop riveter
pry bar
rubber mallet
sand paper
screw drivers
snap fastener tools
socket set
stapler
thread taps
torque wrench
utility knife
vice grips
wire brush
wrenches

LP:

butane igniter
flaring tools
flue cleaner
pipe seamer
tube bender
tube cutter

Plumbing:

basin wrench
blowout plug
drain bucket and funnel
faucet wrench
gluing equipment
PEX crimper
pipe bender
pipe cutter
pipe wrenches
propane torch
snakes
spin weld driver
toilet wand
tube cutter

Electrical:

cable crimpers
channel locks
channel lock pliers
coaxial crimper
generator
inverters
soldering gun/iron
wire connectors
wire crimping tools
wire cutters
wire strippers

Portable Power Tools and Stationary Tools

air chisel
air compressor
air nailer
air nozzle
air stapler
angle grinder
brake cleaners
caustic baths
circular saw
drill bits
electric drill
gas welders
hole saws
impact wrench
jig saw
mitre saw
power washers
reciprocating saws
sander/grinder
sawsall
saw blades
screw gun
shielded metal arc welders
solvent baths
stapler
table saw
wet/dry vacuum

Interior Construction Tools

carpet stretcher
caulking gun
cleaning materials
flooring adhesive spreader
glass cutters
ladder
paint brushes
router
router bits
screening tool
tile cutter
tin snips
trowel
wood clamps

BLOCKS AND TASKS WEIGHTING

BLOCK A FUNDAMENTAL OCCUPATIONAL SKILLS

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	6	5	11	10	10	10	ND	5	5	ND	5	7 %

Task 1 Demonstrates safe work practices.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	20	20	20	10	18	25	ND	20	30	ND	15	20 %

Task 2 Utilizes drawings, codes, standards and service manuals.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	15	15	20	10	20	15	ND	35	30	ND	20	20 %

Task 3 Utilizes tools and measuring equipment.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	24	20	21	40	21	25	ND	20	30	ND	20	25 %

Task 4 Demonstrates common work practices and procedures.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	20	20	22	20	23	20	ND	20	5	ND	25	19 %

Task 5 Provides customer service.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	21	25	17	20	18	15	ND	5	5	ND	20	16 %

BLOCK B PLUMBING SYSTEMS

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	10	15	8	5	12	10	ND	10	15	ND	15	11 %

Task 6 Maintains potable water systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	50	60	50	60	57	50	ND	50	60	ND	40	53 %

Task 7 Maintains waste water systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	50	40	50	40	43	50	ND	50	40	ND	60	47 %

BLOCK C ELECTRICAL

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	14	15	15	20	11	20	ND	19	17	ND	20	17 %

Task 8 Maintains AC electrical system.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	40	45	40	40	27	35	ND	40	40	ND	40	39 %

Task 9 Maintains DC electrical systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	60	55	60	60	73	65	ND	60	60	ND	60	61 %

BLOCK D LP GAS

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	20	10	16	15	11	20	ND	19	20	ND	5	15 %

Task 10 Maintains high pressure LP gas system.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	38	65	23	20	18	25	ND	25	30	ND	40	32 %

Task 11 Maintains low pressure LP gas systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	62	35	77	80	82	75	ND	75	70	ND	60	68 %

BLOCK E APPLIANCES

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	20	10	14	35	17	15	ND	20	15	ND	20	19 %

Task 12 Maintains furnaces and associated systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	25	30	23	30	24	30	ND	40	30	ND	25	29 %

Task 13 Maintains water heaters.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	20	25	19	20	24	15	ND	10	25	ND	20	20 %

Task 14 Maintains ranges and ovens.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	18	15	10	5	20	15	ND	5	10	ND	20	13 %

Task 15 Maintains refrigeration systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	25	20	28	30	24	30	ND	40	30	ND	25	28 %

Task 16 Maintains air conditioning and heat pump systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	12	10	20	15	8	10	ND	5	5	ND	10	11 %

BLOCK F INTERIOR COMPONENTS AND EXTERIOR SHELL

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	10	15	11	5	20	10	ND	12	15	ND	10	12 %

Task 17 Maintains interior components.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	45	60	43	55	55	30	ND	50	35	ND	50	47 %

Task 18 Maintains exterior components.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	55	40	57	45	45	70	ND	50	65	ND	50	53 %

BLOCK G TOWING AND CHASSIS COMPONENTS

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	13	20	17	5	7	10	ND	10	10	ND	15	12 %

Task 19 Maintains undercarriage components on towed vehicles.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	31	50	31	40	20	20	ND	50	35	ND	30	34 %

Task 20 Maintains braking systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	34	30	33	40	15	40	ND	25	50	ND	40	34 %

Task 21 Maintains hitching system.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	35	20	36	20	65	40	ND	25	15	ND	30	32 %

BLOCK H ACCESSORIES

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	National Average
%	ND	7	10	8	5	12	5	ND	5	3	ND	10	7 %

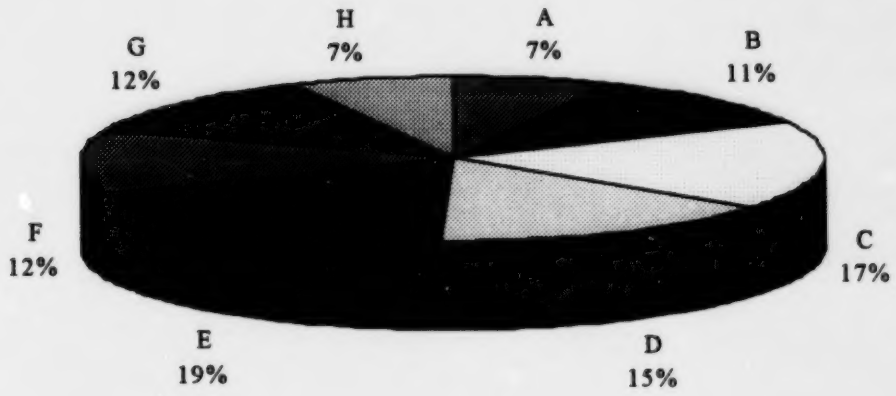
Task 22 Performs accessories/system installations.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	58	60	58	40	67	40	ND	80	35	ND	50	54 %

Task 23 Maintains accessories/systems.

	NF	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YK	
%	ND	42	40	42	60	33	60	ND	20	65	ND	50	46 %

PIE CHART*
Recreation Vehicle Mechanic



TITLES OF BLOCKS

Block A	Fundamental Occupational Skills	Block E	Appliances
Block B	Plumbing Systems	Block F	Interior Components and Exterior Shell
Block C	Electrical	Block G	Towing and Chassis Components
Block D	LP Gas	Block H	Accessories

* The average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from one hundred up to one hundred and fifty multiple choice questions on each examination.

	BLOCKS	TASKS	SUB-TASKS							
A	**Fundamental Occupational Skills**	**1.** Demonstrates safe work practices.	1.01 Complies with government and occupational health and safety regulations and procedures.	1.02 Utilizes personal protective equipment.	1.03 Maintains work area.					
		2. Utilizes drawings, codes, standards and service manuals.	2.01 Interprets blueprints, drawings and schematics.	2.02 Interprets codes, trade standards and government regulations.	2.03 Interprets service literature.					
		3. Utilizes tools and measuring equipment.	3.01 Uses hand tools.	3.02 Operates portable power tools.	3.03 Operates stationary power tools and lifting equipment.	3.04 Operates measuring equipment.	3.05 Operates test equipment.			
		4. Demonstrates common work practices and procedures.	4.01 Installs tubing, piping, hoses and fittings.	4.02 Installs wiring and connectors.	4.03 Applies fasteners, sealants, adhesives and gaskets.	4.04 Performs trade related welding operations. *	4.05 Performs plastic welding operations.	4.06 Cleans parts and components.	4.07 Prepares sketches.	4.08 Performs recreational vehicle preventative maintenance.
		5. Provides customer service.	5.01 Develops customer relations.	5.02 Maintains service records.						
B	**Plumbing Systems**	**6.** Maintains potable water systems.	6.01 Replaces storage tanks and components.	6.02 Repairs storage tanks and components.	6.03 Repairs distribution system.	6.04 Replaces distribution parts.	6.05 Repairs plumbing fixtures.	6.06 Replaces plumbing fixtures.	6.07 Winterizes potable systems.	6.08 Tests potable water systems.
		7. Maintains waste water systems.	7.01 Repairs waste holding tanks and components.	7.02 Repairs collection system.	7.03 Tests waste water systems.					

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RECREATION VEHICLE MECHANIC (2000)

	BLOCKS	TASKS	SUB-TASK					
C	Electrical	8. Maintains AC electrical system.	8.01 Replaces AC power cords and connectors.	8.02 Repairs generator set.	8.03 Services generator set.	8.04 Repairs AC distribution system.	8.05 Tests AC electrical systems.	
		9. Maintains DC electrical systems.	9.01 Services batteries.	9.02 Repairs converters.	9.03 Repairs DC distribution systems.	9.04 Repairs monitoring systems.	9.05 Tests DC electrical systems.	9.06 Checks inverters and solar panels.
D	LP Gas	10. Maintains high pressure LP gas system.	10.01 Inspects high pressure LP system containers, piping and valves.	10.02 Replaces high pressure LP gas system components.	10.03 Services high pressure LP gas systems.	10.04 Recertifies high pressure LP containers. *		
		11. Maintains low pressure LP gas systems.	11.01 Replaces low pressure LP system components.	11.02 Services low pressure LP systems.				
E	Appliances	12. Maintains furnaces and associated systems.	12.01 Diagnoses furnace faults.	12.02 Replaces furnace components and ducting.	12.03 Replaces furnaces.	12.04 Services furnaces, components, ducting and return air.		
		13. Maintains water heaters.	13.01 Diagnoses water heater faults.	13.02 Replaces water heater components.	13.03 Replaces water heater.	13.04 Services water heater and components.		
		14. Maintains ranges and ovens.	14.01 Diagnoses ranges/ovens faults.	14.02 Replaces ranges/ovens and components.	14.03 Services ranges/ovens and components.			

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RECREATION VEHICLE MECHANIC (2000)

	BLOCKS	TASKS	SUB-TASK						
		15. Maintains refrigeration systems.	15.01 Diagnoses refrigeration faults.	15.02 Replaces refrigerator components.	15.03 Replaces refrigerators.	15.04 Services refrigerators, components and venting.			
		16. Maintains air conditioning and heat pump systems.	16.01 Diagnoses air conditioning and heat pump faults.	16.02 Replaces air conditioning and heat pump electro-mechanical components.	16.03 Replaces air conditioning and heat pump systems.	16.04 Services air conditioner and heat pump systems and ducting.			
F	**Interior Components and Exterior Shell**	**17.** Maintains interior components.	17.01 Inspects interior components.	17.02 Replaces sidewalls and ceiling surfaces.	17.03 Replaces flooring and floor coverings.	17.04 Replaces soft goods.	17.05 Repairs cabinetry.	17.06 Replaces interior accessories.	
		18. Maintains exterior components.	18.01 Inspects exterior components.	18.02 Replaces roofing.	18.03 Replaces sidewalls.	18.04 Repairs underbelly.	18.05 Repairs exterior openings.	18.06 Repairs roof lifting systems.	18.07 Repairs slide-out systems.
G	**Towing and Chassis Components**	**19.** Maintains undercarriage components on towed vehicles.	19.01 Services wheel and tires (towed).	19.02 Repairs axles, hubs and bearings.	19.03 Replaces suspension systems.	19.04 Inspects frame.	19.05 Repairs tongue jacks and landing gear.		
		20. Maintains braking systems.	20.01 Repairs electric braking components.	20.02 Repairs hydraulic braking system.					
		21. Maintains hitching system.	21.01 Replaces mechanical towing components.	21.02 Installs towing components.					

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RECREATION VEHICLE MECHANIC (2000)

	BLOCKS	TASKS	SUB-TASK										
H	Accessories	22. Performs accessories/system installations.	22.01 Installs/ replaces plumbing accessories.	22.02 Installs/ replaces entertainment and communication systems.	22.03 Installs/ replaces small electrical household appliances.	22.04 Installs/ replaces safety and security systems.	22.05 Installs/ replaces storage and access systems.	22.06 Installs/ replaces power supply systems.	22.07 Installs/ replaces LP accessories.	22.08 Installs/ replaces leveling, stabilizing and jacking systems.	22.09 Installs/ replaces auxiliary chassis and towing components (suspension aids).	22.10 Installs/ replaces awning, skirting and add-a-rooms.	22.11 Installs/replaces range hoods.
			22.12 Installs/ replaces ice makers.										
		23. Maintains accessories/systems.	23.01 Repairs plumbing accessories.	23.02 Repairs entertainment and communication systems.	23.03 Repairs small electrical household appliances.	23.04 Services safety and security systems.	23.05 Repairs storage and access systems.	23.06 Repairs power supply systems.	23.07 Repairs LP accessories.	23.08 Repairs leveling, stabilizing and jacking systems.	23.09 Repairs awning, skirting and add-a-room.	23.10 Repairs range hood	23.11 Repairs ice makers.

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